ALSO IN OUR NEWS SECTION ■ San Bernardino County defies a California ban on e-voting machines. PAGE 5
On the Mark: How to convince your business units that open-source works. PAGE 6

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MAY 17, 2004 ■ VOL. 38 ■ NO. 20 ■ $5/COPY

Microsoft Unfolds Its Windows Server Road Map

Update to come in 2005, Longhorn in 2007; effect on Software Assurance users is unclear

BY CAROL SLIWA

A Microsoft Corp. executive last week cleared up what had been a murky Windows Server plan, affirming release dates of 2005 for a product update code-named R2 and 2007 for the next major software release, known as Longhorn.

Bob Muglia, senior vice president of Microsoft's Windows Server division, said the company wants to be consistent with the product's release cycle. Plans call for a major release of Windows Server roughly every four years and an incremental update two to two and a half years after each major release, he said. Muglia earlier this year told *Computerworld* only that Longhorn would emerge no sooner than 2006 [QuickLink 45522].

INSIDE
Microsoft's Bob Muglia on the Linux threat.
PAGE 54

Windows Server 2003, the last major release, shipped in April last year. Microsoft has pledged that its first service pack — an update that typically includes bug and security fixes — will come in the second half of this year. SP1 will also form the basis of a new release of Windows Server 2003 designed to run on Advanced Micro Devices Inc.'s 64-bit Opteron chips and Intel Corp.'s Xeon EM64T processors.

The follow-on R2 product is targeted for the second half of 2005, according to Muglia. R2 will bundle in various feature packs that Microsoft has put

Microsoft, page 54

MCI, Nortel Attempt to Allay Users' Doubts About Stability

N+I attendees worry about ethics, support

BY MATT HAMBLEN
LAS VEGAS

At NetWorld+Interop last week, MCI Inc. and Nortel Networks Ltd. both tried to put their financial problems behind them and get on with business as usual. But they continued to be dogged by concerns among users about their business practices and their ability to provide reliable customer service.

The concerns were voiced after MCI CEO Michael Capellas and Malcolm Collins, president of enterprise networks at Nortel, delivered separate keynote addresses at N+I. Each company also used the conference to detail plans for IP-based conferencing

N+I, page 16

"Mr. Capellas should pay attention to reliability and should not ignore existing customers as MCI finds new business.

– Fred Gratke, assistant vice president of telecommunications, Burlington Northern and Santa Fe Railway

IT Oversight Gets Attention At Board Level

Novell, FedEx among companies boosting governance functions

BY THOMAS HOFFMAN

A small number of companies, including Novell Inc. and FedEx Corp., have elevated responsibility for IT governance to their boards of directors in an attempt to ensure that they have high-level oversight of technology investments.

Novell established its board-level IT oversight committee in January, and Richard Nolan, an outside director who chairs the committee,

Governance, page 12

KNOWLEDGE CENTER
MOBILE & WIRELESS

JOEL NAKAMURA

THE Untethered Worker

SPECIAL REPORT

IT managers can offer roaming employees two new capabilities: voice-over-IP phones that work with wireless LANs, and nationwide high-speed cellular data networks. We explain the options. **Stories begin on page 37.**

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NEWSPAPER

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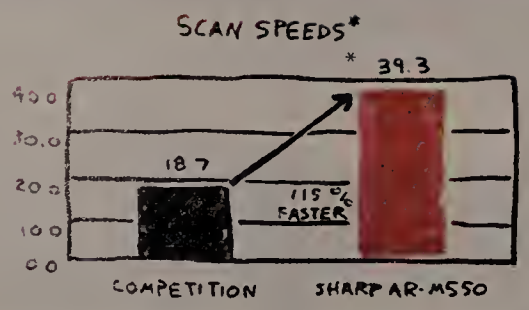

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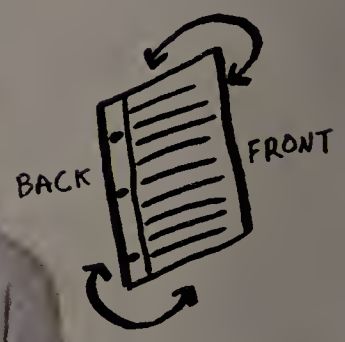

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CONTENTS

05.17.04

Follow, Don't Lead
In the Management section: Last year, Nicholas G. Carr's contrarian article in the *Harvard Business Review* drew the ire of IT leaders everywhere. Now he's back with a book, *Does IT Matter?* **Page 31**

Asset Management Moves Out
In the Technology section: An increasing number of IT managers, like Ernie Botte (left) of Wheelabrator, are outsourcing their enterprise asset management systems to save money in the short term and take the burden off in-house IT staffs. **Page 25**

NEWS

4 **IBM demonstrates** a modular storage array that puts disk drives into removable "bricks." But marketing plans haven't been finalized.

5 **The Pentagon** hasn't kept Congress properly informed regarding how it's spending its $27.9 billion IT budget, an audit reveals.

8 **SAP is developing** an enterprise services architecture based on Web services and its NetWeaver middleware.

9 **The swift arrest** of the Sasser worm's creator is the exception, not the rule, say experts.

12 **Bluetooth security fears** are overblown, say vendors, but they still advise taking steps to reduce risks.

16 **SAS upgrades** its marketing data analysis and campaign management software.

19 **IT contracts** often fail to deliver what users expect due to negotiation issues and a lack of coordination within vendors.

ONLINE

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QuickLink a2420

What's a QuickLink?
On some pages in this issue, you'll see a QuickLink code pointing to additional, related content on our Web site. Just enter that code into our QuickLink box, which you'll see at the top of each page on our site.

OPINIONS

6 **On the Mark: Mark Hall** says that if you believe open-source technology can solve IT problems in your business units, there's a tool to help you sell the idea.

20 **Maryfran Johnson** notes that health care providers have wasted millions because their supply chains are inefficient. But there are remedies.

20 **Michael H. Hugos** has ideas on how IT can be used to increase revenue and differentiate your company.

21 **Thornton A. May** thinks IT managers should be prepared for the demographic stew that their teams will become.

29 **Robert L. Mitchell** says that as Bluetooth-enabled devices catch on and people start bringing them to work, personal-area networks could become another area to manage.

34 **Barbara Gomolski** warns IT managers not to be naive about outsourcing. She offers five basic rules to help you avoid common pitfalls.

56 **Frankly Speaking: Frank Hayes** has been to Vegas to see the dawn of the age of the application appliance.

DEPARTMENTS/RESOURCES

At Deadline Briefs 4
News Briefs 6, 8
Letters 21
IT Careers 50
Company Index 53
How to Contact CW 53
Shark Tank 56

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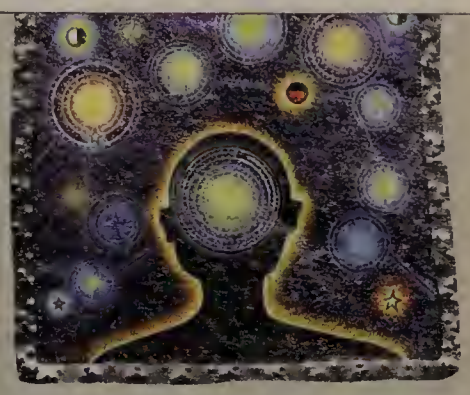

The Untethered Worker

This special report covers two of the newest capabilities in the fast-changing wireless world: IP telephony over wireless LANs and the emergence of nationwide high-speed cellular networks. who are finding their way through a sometimes difficult process. **ONLINE:** Find out where high-speed cellular services from Verizon Wireless, Nextel and AT&T Wireless are offered. QuickLink 46028

SPECIAL REPORT

PACKAGE BEGINS ON PAGE 37.

40 **Wireless LANs Find Their Voice.** Developments in wireless voice-over-IP technology have pushed wireless devices from bleeding edge to mainstream. St. Agnes HealthCare's CIO, William Greskovich (left), equipped hospital staff with VoIP communicators and realized dramatic improvements in productivity.

42 **Which Wireless Service?** Figuring out which nationwide cellular plans will best suit your enterprise can be tough. Read about users

44 **Tales From the Road.** Global road warriors find they need to outfit themselves with a plethora of gadgets to ensure wireless connectivity anytime, anywhere.

46 **The Almanac:** Beware: Carriers have placed locks on smart phones to prevent customer churn. Plus, travelers on some Boeing flights (right) will be able to get high-speed Internet access for under $30.

47 **Opinion:** Encryption is better. Installation is a snap. User acceptance is high. Wireless problems have come and gone, right? Columnist Mark Hall doesn't think so.

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Maximum Wireless Security. Book excerpt: A look at how hackers compromise wireless networks.
QuickLink 45526

The Enemy Is Us. Opinion: User behavior is the biggest problem in wireless security, but solutions are in development.
QuickLink 46634

Wireless Glossary. Don't know the difference between 802.11g and GPRS? Here are definitions of some common terms in the mobile and wireless world.
QuickLink 46657

Page Turners. These recent books can help you untether your workforce.
QuickLink 46564

AT DEADLINE

HP to Pay $105M To Settle Dispute

Hewlett-Packard Co. said it has agreed to pay the Canadian government $105 million (U.S.) to settle a dispute related to IT contracts that HP took on when it acquired Compaq Computer Corp.

In March, Canada's Department of National Defence claimed it had been bilked out of the money by a contract-invoicing scam involving payments that were supposedly being made to subcontractors.

HP last week said there's no evidence that any of its employees derived illegal benefits from the alleged scheme. But the company added that it decided "to honor its contractual obligations, rather than engage in protracted litigation." HP said it will try to recover the settlement amount "from the individuals and companies responsible."

Dell Reports 21% Revenue Increase

Dell Inc. reported a 21% increase in revenue for its first quarter and attributed the performance to strong sales of its servers and notebook PCs. U.S. corporate sales were the highest they have been in three and a half years, said Jim Schneider, Dell's chief financial officer. "We're not seeing huge replacements, but people are more active," he added. Dell earned a $731 million profit on revenue of $11.5 billion in the quarter, which ended April 30.

BEA Falls Short On Software Sales

BEA Systems Inc. said revenue rose 11% year over year in its first quarter, which ended April 30. But it added that sales of its middleware dropped 2% and were below plan. CEO Alfred Chuang blamed the shortfall on a software transition and disruptions from sales force changes. BEA said its head of sales for the Americas has left the company in one of several management changes that were announced.

IBM Shows Off Modular Array

Storage brick prototype may eventually replace Shark, vendor says

BY LUCAS MEARIAN
CAMBRIDGE, MASS.

IBM LAST WEEK demonstrated a prototype of a modular disk array built around self-contained storage "bricks" that plug into one another and include disk drives, a processor, memory, and an eight-port switch for transmitting data to neighboring modules.

IBM officials said the ability to add or remove the modules would let users install and configure an integrated storage chassis that is capable of scaling infinitely and requires little or no maintenance. The modular technology is being eyed as a possible replacement for IBM's Enterprise Storage Server disk array line, known informally as Shark.

But marketing plans haven't been finalized. The modular array, which is being called Ice Cube, could be ready for release by next year — but shipments also might be as far off as 2007, according to IBM. And the company may decide to use only some pieces of the technology in other products, said Jai Menon, chief technologist for storage systems architecture and design at IBM.

Snap-on Storage

Menon said the Ice Cube concept is similar to that of Lego blocks, allowing users to snap together individual modules without disrupting others. Each module can interoperate with five adjoining ones and replicate data to them for backup purposes, he added. The 3-ft. prototype that was shown during a press briefing here contained 27 bricks, each capable of holding 1.2TB of data.

"I think it's pretty amazing. It certainly is simpler and takes less floor space" than conventional arrays, said Thomas Rowland, a vice president of technology at financial services firm Pershing LLC in Jersey City, N.J. "If the price, reliability and the functionality is there, that'd be great."

Bob Venable, manager of enterprise systems at BlueCross BlueShield of Tennessee Inc., said he likes the idea of a disk array that could help cut maintenance and storage management costs, which make up 80% of his storage-related expenditures.

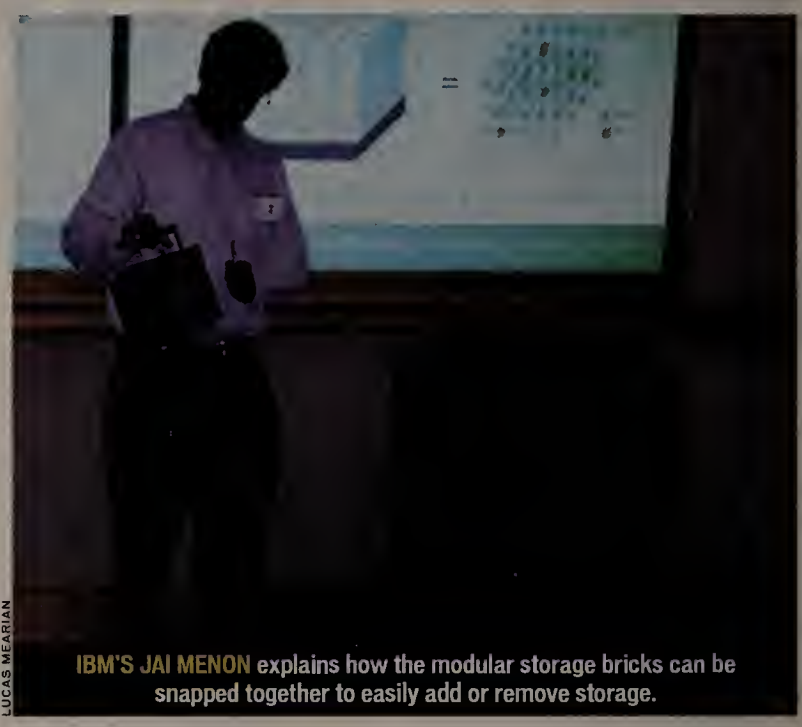
"That's all I'm worried about — keeping administration costs low," Venable said. "I think it's fascinating."

Rowland and Venable both gave presentations about their use of IBM's current storage devices during the briefing.

Other vendors have talked about using the brick concept in arrays, said John McArthur, an analyst at market research firm IDC. But he added that he has yet to see anything like the prototype built by IBM. "I think it's really interesting," McArthur said. "But as we know, it's a long ways off."

Menon said Ice Cube would require only 120 square feet of floor space to store a petabyte of data, compared with 800 square feet using conventional arrays.

He added that application servers could use one or more bricks for storage and that the device would keep a duplicate copy of data in each module. If one module failed, built-in software would transfer its data to another brick for continued use and then create a second duplicate of the information, Menon said. **46885**



LUCAS MEARIAN

IBM'S JAI MENON explains how the modular storage bricks can be snapped together to easily add or remove storage.

MORE ON STORAGE

For additional information and resources, visit our Storage Knowledge Center:

QuickLink k1700
www.computerworld.com

IBM Adds Storage Devices, Takes Aim at EMC

IBM ratcheted up its war of words with storage rival EMC Corp. by detailing its "offense plan against EMC," which includes a new entry-level disk array and IBM's first WORM tape cartridge.

IBM said its FAStT100 entry-level disk array scales from 256GB to 56TB and offers many of the same features as its midrange FAStT600 device, but with lower-cost Serial ATA drives instead of Fibre Channel ones. The FAStT100 is due to begin shipping by July.

The WORM tape cartridge, which supports write-once, read-many technology, works with IBM's Model 3592 tape drives and can be used in tape libraries from both IBM and Storage Technology Corp. The cartridge will be available this Friday in 60GB and 300GB versions and is designed for storage of corporate records to meet regulatory and internal audit needs, IBM said.

Bob Venable, manager of enterprise systems at BlueCross BlueShield of Tennessee, has expanded his storage-area network (SAN) from 10TB to 110TB over the past four years by installing eight of IBM's Shark high-end arrays. Despite the big increase in capacity, Venable said he has been able to save $1.5 million per year in storage management costs by using IBM's software to make his operations more efficient.

He added that he hopes to roll out IBM's SAN Volume Controller storage virtualization software next month to manage his installation of Shark devices and IBM's FAStT midrange arrays as a single pool of capacity.

IBM and EMC took verbal shots at each other over virtualization technology late last month [QuickLink 46560].

Last week, Ken Steinhardt, EMC's director of technology analysis, responded to the latest volley by claiming that IBM is offering users "vendor lock-in." He added that EMC has opened up its application programming interfaces and added support for the SMI-S storage management interoperability standard across its Clariion and Symmetrix disk array lines.

– Lucas Mearian

Calif. E-voting Ban Challenged

County plans to ignore secretary of state's directive

BY DAN VERTON

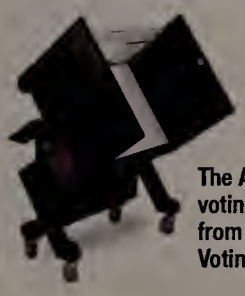
The battle over electronic voting systems took an unexpected turn last week when election officials in San Bernardino County, Calif., announced plans to defy a state-imposed ban on the systems in the upcoming November presidential election.

In a statement on May 11, county officials said they plan to use touch-screen voting systems developed by Oakland, Calif.-based Sequoia Voting Systems Inc. The decision is in direct defiance of an April 30 directive by the California secretary of state that stripped the systems of their certification in 10 counties, pending security improvements. The directive also banned the use of touch-screen systems from McKinney, Texas-based Diebold Election Systems in four other counties.

The controversy over the use of the systems stems from research and public statements by independent IT security experts who uncovered glaring security vulnerabilities in the hardware and software used in many of the e-voting systems on the market [QuickLink 46735].

System Was Certified

"The California Secretary of State certified this system in its current form prior to the March 2, 2004, election, and absolutely nothing has occurred since that certification to call the system's performance or reliability into question," the San Bernardino County Board of Supervisors said in the statement.



The AVC Advantage voting machine from Sequoia Voting Systems

The county said it reserves the right to join Riverside County officials in a lawsuit filed in federal court against the state on May 6 seeking to overturn the ban. "[Secretary of State Kevin] Shelley's ban on electronic voting systems is based on conjecture, supposition and what-ifs," said Roy Wilson, chairman of the Riverside County Board of Supervisors.

Doug Stone, a spokesman for the California Secretary of State, said Shelley's office is "cautiously optimistic" that it will reach an agreement with San Bernardino County before the November election.

Two prominent security experts said the decision by county officials is misguided.

"If Sequoia had chosen to rig the outcome of the election in March, nobody could have known it," said Avi Rubin, a professor at the Johns Hopkins University Information Security Institute in Baltimore.

Jeremy Epstein, senior director for product security at Fairfax, Va.-based WebMethods Inc., agreed with Rubin's assessment of electronic voting systems and said that Rubin isn't alone in his concerns. Epstein is one of thousands of private-sector executives who have signed an online petition at *www.verifiedvoting.org* that calls for vendors to provide voter-verified paper audit trails (VVPAT) for their systems.

"The bottom line is that no [e-voting] system without a VVPAT is ever going to be reliable," Epstein said. **46891**

IBM Taps Middleware To Eliminate Fat Clients

BY PATRICK THIBODEAU

IBM last week weighed in with a new alternative to fat clients that gobble up corporate IT resources.

IBM's Workplace Client Technology takes a middleware approach to delivering server-based applications to a slimmed-down client that can run Linux, Windows and, later this year, Mac OS. A micro-edition of the middleware will support a wide range of handheld and embedded operating systems as users move from device to device.

"You can certainly understand the rationale for trying to come up with a solution in this space," said Guy Mills, assistant vice president of information services at Manulife Financial Corp. in Toronto. Mills, who manages 22,000 desktops running Microsoft Windows and Office, said support can cost up to $1,000 per year for each desktop user.

While Mills said he believes IBM's Workplace offering has potential for use in call centers and with claims processors, he doesn't see it as an option for knowledge workers who are heavy users of Microsoft Word and Excel. Still, he said he's interested in cutting support costs, particularly through server-based management of desktops, and he will look at products from IBM and other vendors.

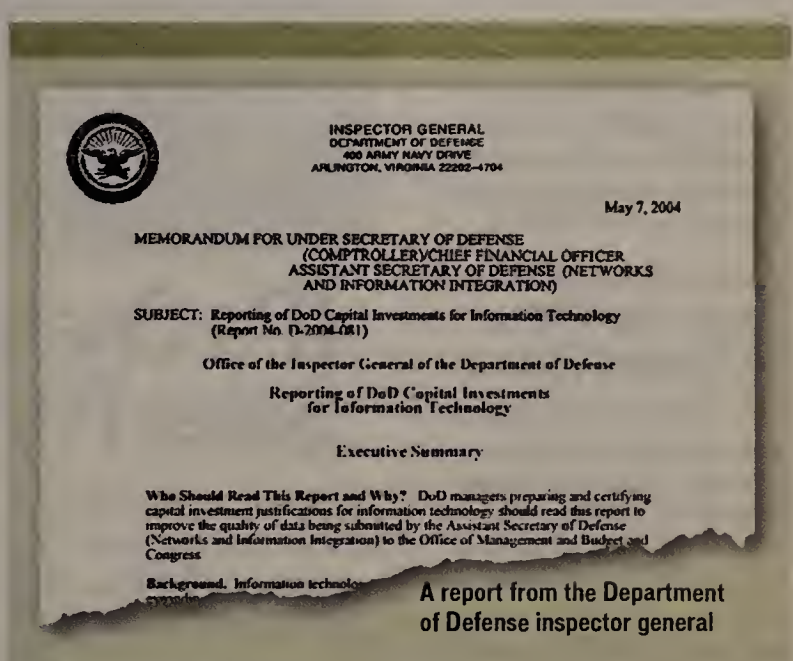
"I think there is a latent demand out there for a lighter-weight office desktop, so we are keeping our eyes on things like Workplace, Linux and the open-source office products that, at some point, might become a viable option for us," Mills said.

Adopting the Workplace middleware technology and running Linux could eliminate Microsoft products from many desktops. But Steve Mills, senior vice president and group executive in charge of IBM's software business, said the company is simply addressing user needs rather than developing an "anti-Microsoft" strategy. **46888**

Losing Weight

IBM said it will deliver its Workplace Client Technology by the end of the quarter. Components include:

- **IBM Lotus Workplace Messaging collaboration product:** $29 per user over three years
- **IBM Lotus Workplace Documents business productivity product:** $29 per user over three years
- **Workplace Client Technology middleware:** $24 per user per year



INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
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ARLINGTON, VIRGINIA 22202-4704

May 7, 2004

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE (COMPTROLLER)/CHIEF FINANCIAL OFFICER
ASSISTANT SECRETARY OF DEFENSE (NETWORKS AND INFORMATION INTEGRATION)

SUBJECT: Reporting of DoD Capital Investments for Information Technology (Report No. D-2004-081)

Office of the Inspector General of the Department of Defense

Reporting of DoD Capital Investments for Information Technology

Executive Summary

Who Should Read This Report and Why? DoD managers preparing and certifying capital investment justifications for information technology should read this report to improve the quality of data being submitted by the Assistant Secretary of Defense (Networks and Information Integration) to the Office of Management and Budget and Congress.

Background. Information technol

A report from the Department of Defense inspector general

Audit Finds Omissions in Pentagon's IT Budget Data

WASHINGTON

The Pentagon is under fire for failing to adequately show how it's spending its $27.9 billion IT budget.

Four months ago, the U.S. General Accounting Office berated U.S. Department of Defense officials for sloppy accounting practices that led to a $1.6 billion discrepancy between two key IT budget reports [QuickLink 43720]. Now the Defense Department's own inspector general has released an audit report that accuses the department of failing to fully disclose required IT expenditure data to Congress and the Office of Management and Budget.

According to the audit report released on May 7, 170 of the 198 Capital Investment Reports submitted to the OMB and 182 of the 197 Selected Capital Investment Reports submitted to Congress didn't include one or more required data elements. Among the data elements that often weren't addressed were business-case justifications, realistic cost and schedule goals, and measurable performance benefits.

The result of these omissions, according to the report, is that the information reported to the OMB and Congress has been of limited value in helping to determine how much money the Pentagon should get for IT in future years. In addition, because of the lack of information, the OMB and Congress have been unable to determine whether the department has been managing its IT programs in accordance with government regulations.

Cheryl Roby, deputy assistant secretary of defense for resources, said in a statement that changes will be made immediately to ensure that the CIOs of the department's various component agencies report all of the required data to the Department of Defense CIO for forwarding to the OMB and Congress.

– Dan Verton

BRIEFS

Novell Modifies Its Linux Support Fees

Novell Inc. announced new pricing for its SUSE Enterprise Linux operating system that lets users pay for support on a per-incident basis as an alternative to buying a support contract for each server. The move separates support costs from bug-fix and upgrade fees, which will still be charged per server. Novell also expanded its Premium Service offering, which provides enterprisewide support, to include its Linux products.

Symantec Warns Of Firewall Flaws

Symantec Corp. issued patches designed to plug four security holes in its client-level firewall software for Windows. The vulnerabilities, which affect Symantec's Client Firewall and Client Security tools for corporate users and its consumer products could be used to launch denial-of-service attacks or to run malicious code on vulnerable systems.

Microsoft Releases Patch for Windows

Microsoft Corp. released a single patch as part of its monthly security update process to fix a flaw in its Windows Help and Support Center software. The vulnerability affects Windows XP and Windows Server 2003 and could be exploited to take full control of systems that haven't been patched, Microsoft said. It noted that installing the patch will disable some features.

Short Takes

MICROSOFT said it's dropping its line of Wi-Fi wireless networking products. . . . INTEL CORP. upgraded three of its Pentium M processors for laptop PCs, increasing their speeds through a new manufacturing process. Information posted inadvertently on Dell Inc.'s Web site indicated that Intel will add four more mobile chips in the third quarter.

ON THE MARK

HOT TECHNOLOGY TRENDS, NEW PRODUCT NEWS AND INDUSTRY GOSSIP BY MARK HALL

MATTHEW FAULKNER

IT's Open-Source Sales Pitch Gets . . .

. . . a sophisticated tool to convince reluctant business units to adopt the technology. "IT managers struggle with the internal promotion of projects," observes Charles Stack, CEO of Flashline Inc. in Cleveland. "Sometimes the hardest part is to convey the message of a technology's value to the business side of an organization." To remedy this, Flashline today is releasing its Pattern Book for Open Source in the Enterprise. Check it out at QuickLink a4530. The Pattern Book is packed with enough goodies to turn even the geekiest open-source advocate into a slick, business-savvy salesman. Among the 20 tools included are staffing documents, budget templates, business-case scenarios and even canned presentations to help you cinch the open-source argument. It's also open-source itself — and free.

2 Minutes
Time it takes to provision 3,000 Linux systems with Levanta, according to the company.

Open-source browser, mail client reach . . .

. . . new beta milestones. The Mozilla Foundation in Mountain View, Calif., has released beta Version 0.6 of Thunderbird, its mail client under construction. Beta Version 0.9 of its browser, Firefox, will be available next month. Final release for both will be sometime in Q3. The Thunderbird beta includes a Bayesian spam filter, and Firefox will add tab browsing among other features in its next update. Does the world need yet another mail client or browser? Mozilla insiders obviously think so, and millions of individual free copies have been downloaded. But those insiders argue that the most likely users will be at large companies that need mail clients and browsers to be independent of the operating system. And Firefox and Thunderbird run on Linux, Unix, Mac OS and Windows. In fact, whispers one, a Fortune 100 company will be rolling out 53,000 copies of both Thunderbird and Firefox when they reach the 1.0 stage.

2.2M
Number of downloads of Thunderbird from Mozilla.org in a two-week period.

Mainframe Linux provisioning app . . .

. . . targets Intel machines. Akmal Khan, CEO of San Francisco-based Levanta Inc., claims that the third release of Levanta, announced today, solves the "scale-out problem of Linux in the data center." With hundreds, even thousands, of Linux servers and blades running inside some companies, a zippy provisioning tool is essential. Levanta, which is also the new moniker of Linuxcare Inc., can activate predefined virtual or hardware Linux systems on the fly when they're needed, then hibernate them as demand decreases. It has authoritative change control, so computers can't be reconfigured — even by users with root access. Cost? About $1,000 per server.

Gateway bridges gap between . . .

. . . Web services and middleware messaging systems. This week, Cambridge, Mass.-based Systinet Corp. releases its Systinet Gateway, a bidirectional interface between applications using Tibco, WebSphere and other message-oriented middleware applications and newer Web services programs. Applications on either side of the gateway can automatically access data or services from otherwise incompatible software. Systinet will also release this week Version 5.0 of its UDDI registry, adding digital signatures for authentication and improved search capabilities. Both products are priced per CPU: $25,000 for the gateway, and $10,000 for the registry.

New tool chucks "mating ritual" . . .

. . . between frustrated users and help desk workers, claims Bruce Mowery, vice president of marketing at SupportSoft Inc. in Redwood City, Calif. He says that his company's new VoiceAssist product, which ships at the end of this month, drops a small agent onto a user's desktop that noses around the system, creates an inventory of the PC's assets, evaluates operating conditions and even makes an initial diagnosis of the problem and presents the information to the help desk staffer, cutting the vast chunks of time that end users chew up explaining their problems and environments.

Hardened Dell dual-CPU box not . . .

. . . from Dell Inc. It's from Augmentix Corp. Chris Nelson, the Houston-based company's CEO, says not all PCs and servers live the good life on tidy desktops or clean data centers, so they need protection. That's why Augmentix buys Dell 1750 servers, completely disassembles them and then reassembles them into ruggedized shells and a new size for rack mounting. The company also adds a proprietary Peripheral Component Interconnect card that delivers the high-availability features necessary for those tougher environments. Nelson says that while pricing isn't set yet, he estimates that the competition will charge twice his price because of his Dell deal, which cuts millions from his research and development budget. Even his marketing department borrowed from Dell's nomenclature. The Augmentix 1750 will ship at the end of this quarter.

46880

The Augmentix 1750

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"Our goal in information systems is to leave behind an organization that's more efficient than when we arrived." — **Sue Simonett**

Sue Simonett
Senior Director of IS

General Mills, Inc.
Minneapolis, Minnesota

Sue Simonett has always worked in Information Systems (IS), a career she loves both for the strategic view it has afforded as well as the ability to positively impact the lives of end users.

Recently charged with reinventing the way that a sales force of 450 retail reps managed their numerous product lines, she's implemented an ingenious handheld system that brings technology to the front lines of the company.

Using a stylus and a handheld mobile device, sales reps now electronically record product information while in the store. Gone are the days of messy paper logs and evenings spent keying the day's data into a laptop for downloading to corporate. At the end of each day, the rep simply places the device in a cradle and the data is sent directly from the handheld. The results: sales reps that can handle more products with fewer errors, and get the right products to the right shelves faster.

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BRIEFS

Cisco to Add Jobs After Strong Q3

Cisco Systems Inc. reported a 22% increase in revenue for its third quarter and said it plans to add 1,000 sales and engineering jobs by year's end. Cisco President and CEO John Chambers said during a teleconference that the hiring plans were driven by the strong third-quarter results. Cisco earned a $1.2 billion profit on revenue of $5.6 billion during the quarter, which ended May 1.

HP Acquires Two IT Training Firms

Hewlett-Packard Co. said it has bought two companies that offer IT management training services. HP acquired Dallas-based IT Infrastructure Management LLC and London-based CEC Europe Service Management Ltd., both of which train IT workers on operations and project management. HP didn't say what it paid for the companies, which will become part of its HP Services unit.

Gateway Hits HP With Patent Claims

Gateway Inc. has filed several counterclaims against HP as part of a patent infringement dispute between the two companies. Poway, Calif.-based Gateway claimed that HP is violating patents it holds related to multimedia functionality and signal routing. HP sued Gateway in March, alleging that it was infringing upon patents covering notebook PC design, power management and graphics.

Short Takes

A California state court judge has set a Nov. 1 trial date for PEOPLESOFT INC.'s lawsuit charging ORACLE CORP. with libel and unfair competition. . . . Supply chain software vendor i2 TECHNOLOGIES INC. has agreed to pay $84.9 million to settle a series of shareholder lawsuits that were filed in federal court in Texas.

SAP Moves to Make Its Software More Flexible

Says NetWeaver will have tighter ties to .Net and support adaptive computing

BY MARC L. SONGINI
NEW ORLEANS

OPENNESS and flexibility have become mantras for SAP AG, which was once notorious for its all-or-nothing approach to ERP applications. And at its Sapphire '04 user conference here last week, SAP took further steps aimed at making its applications easier to use.

For example, SAP and Microsoft Corp. said they're working to tighten the links between SAP's NetWeaver middleware technology and Microsoft's Office applications and Visual Studio .Net development tools.

In addition, SAP announced plans to add adaptive computing capabilities to NetWeaver next month so the software can shift applications between servers as needed.

SAP said both developments are part of its effort to create an enterprise services architecture based on NetWeaver and Web services technology in order to simplify the process of tying its applications with those from other vendors.

SAP's more modular approach to software installation is appealing to Ronald Moses, ERP analyst and team leader at Arctic Cat Inc. Thief River Falls, Minn.-based Arctic Cat, which makes snowmobiles and all-terrain vehicles, uses SAP's R/3 4.6 applications and the vendor's CRM software to run its business operations.

"The problem with SAP has been, until recently, it was an all-or-nothing approach, particularly with upgrades," said Moses. If one application module was being upgraded, the rest had to be as well to ensure continued interoperability — a process that Moses said he "dreaded."

However, he said, with SAP's more flexible building-block approach, "we can pick and choose those things we want to upgrade and keep other things the way they are."

Kathy Hamperian, director of information management at the University of Kentucky in Lexington, said the tighter integration between NetWeaver and .Net "positions us very well."

For example, the school runs a .Net-based point-of-sale system, and Hamperian said the integration road map detailed last week could make it possible to exchange information between that system and the university's SAP ERP applications in real time.

Tasty Baking Co. in Philadelphia is installing SAP's applications on Windows servers. Autumn Bayles, Tasty Baking's CIO, said she thinks the closer ties between NetWeaver and .Net will be good for her company if they help make it easier to run the SAP software under Windows.

SAP said it plans this summer to begin beta-testing a software development kit for customizing its Enterprise Portal software via Visual Studio .Net. The company added that it will release an upgraded version of its .Net connector in August, while Microsoft plans early next year to ship tools for linking NetWeaver to Exchange Server and its Windows SharePoint Services collaboration software. **46895**

Sapphire Announcements

- SAP plans to offer bundles of CRM and ERP applications for midsize users; it will also offer software tailored for companies in specific industries.
- The vendor is working with Research In Motion Ltd. to integrate that company's BlackBerry handheld devices with mySAP CRM.
- SAP has released supply chain management and collaboration software for companies that offer logistics services.

APPLICATION AWARE

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Plattner Hopes to Improve Software Design Process

Last May, **Hasso Plattner** stepped down as SAP's co-CEO and chairman of the software vendor's executive board. He now chairs SAP's supervisory board, the German equivalent of a U.S. company's board of directors. But Plattner is still active inside SAP, which he co-founded in 1972. At Sapphire '04, he spoke with *Computerworld* about his current role and other issues involving the company.

What have you been up to since you changed your position? I'm chairman of the supervisory board, with some formal responsibilities to watch over the execution of the company's [operations]. I run several councils involved with technology, human resources and a general one where we discuss investments and acquisitions and so on. The technology committee handles all aspects of development. The task I feel most comfortable with is software design and finding ways to improve it.

What are you doing in that area? I have small teams to make prototypes of prototypes. I have always wanted to do something like they do in car manufacturing. They do dozens of versions of prototypes, and then management goes for "2-B," and they decide that makes sense, and then they spend the real money. We give [our teams] tasks to fulfill, and the designers come up with completely different ideas.

These groups don't own the code and aren't allowed to own the code, except for the short period of life for the prototype. With these projects, we find some ways and methodologies of how to improve the path of coming up with a good prototype. . . . I'm more interested in the methodology. In the end, the 8,000 developers [at SAP] will work better and faster.

As the business applications market leader, what keeps SAP honest? Extreme alignment with the customer. With large companies, you can't convince them to act against their own will and desires. There is still enough competition – our applications are far from being like Microsoft Office.

SAP has had a reputation for developing software that is very rigid. Are you a humbler company now? You might find some hard-core [SAP employees] who said, "We have done this for you to use, and it's as good it gets," and others who said, "Tell me more about your problems, and I can solve them all, or try to." If you think you are untouchable, that's not good. I think the tough years in the dot-com era changed SAP, so that we are a little more careful.

– Marc L. Songini

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Bringing Worm Writers to Justice Is No Easy Task

Speedy arrest of German teen in Sasser case is only a small victory, experts say

BY JAIKUMAR VIJAYAN

Despite the quick arrest of the author of the recent Sasser worm, much still needs to be accomplished if catching and prosecuting such criminals is to be the rule rather than the exception, users and analysts said last week.

From a technology perspective, more effort needs to be devoted to building better network tracking, monitoring and logging capabilities.

On the legal front, international laws need to be more standardized to enable efficient cross-border pursuit and capture of cybercriminals, security experts said.

Fear of Retribution

There is also an element of hesitation and even fear on the part of many companies to actively go after criminals who launch such attacks, said Bruce Schneier, co-founder and chief technology officer of Counterpane Internet Security Inc., a Mountain View, Calif.-based provider of managed security services.

"They don't want to make waves because they are very afraid of retribution," he said.

Sven Jaschan was arrested near Rotenberg, Germany, on May 8, and he subsequently confessed to creating the Sasser worm. The 18-year-old was apprehended following a tip to Microsoft Corp. from a group of people in the culprit's home state of Lower Saxony.

While the speed of the arrest is encouraging, it would be a mistake to overstate its significance, analysts said.

"This is a big improvement over the [nonexistent] arrests . . . of yesteryear," according to Ken Dunham, a director at iDefense Inc. in Reston, Va. But the fact remains that the majority of worm writers are never caught.

'A Disgrace'

Even when they are caught, most cybercriminals receive little more than a slap on the wrist, said Michael Kamens, global network security director at Thermo Electron Corp., a $2 billion manufacturer of scientific equipment in Waltham, Mass.

"What's going on is really a disgrace," said Kamens. His company, like others, is spending more and more resources on fending off numerous assaults on its networks. When it has been able to pinpoint attack sources, Thermo Electron has asked Internet service providers to shut down the offending servers or Web sites from which the attacks are launched.

NEWSCOM.COM

SASSER WORM creator Sven Jaschan was arrested quickly, but the majority of worm writers are never caught.

"If we did have an attack that was serious enough, we would have no hesitation to go to the FBI with it," Kamens said. "If you simply sit back and don't prosecute, nothing is going to happen."

The Bank of Alameda in California has a similarly aggressive policy for dealing with attacks that target its systems. On two occasions, the community bank has worked with local law enforcement agencies to track down perpetrators, said CIO Michael Roberts.

But when it comes to mass worms and viruses, the bank's policy is to keep a low profile.

"We don't want to make any waves," Roberts said. "In our situation, we are more focused on blocking attacks as opposed to going after the ones who launch them."

When companies do choose to go after individuals, the obstacles are formidable, security experts said.

More needs to be done to "ensure that logs exist to allow tracing originating traffic back to its actual source," said Russ Cooper, an analyst at Herndon, Va.-based TruSecure Corp. "ISPs continually fight these attempts by law enforcement, presumably because they feel the burden of having to comply will be too heavy."

Differences in various countries' laws and penalties also pose a challenge, said Carole Theriault, a security analyst at antivirus firm Sophos PLC in Abingdon, England.

For instance, last year, U.K. authorities imposed a two-year jail sentence on a worm writer for infecting more than 27,000 PCs. But in the Netherlands in 2001, the author of the widespread Anna Kournikova worm was sentenced to 150 hours of community service. 46887

Correction

OUR "PREDICTING DISASTER" sidebar on page 27 of the April 12 issue incorrectly stated that Opnet Technologies Inc.'s IT Guru suite was used to pull data from Mercury Interactive Corp.'s SiteScope. In fact, Opnet's product does not work with SiteScope.

WALLON WARNING

A new worm uses a flaw in Yahoo and Internet Explorer to spread:

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www.computerworld.com

Intrusion Response Dips Down to End-User Level

BY JAIKUMAR VIJAYAN

The need for companies to respond in real time to both external and internal network attacks is fueling interest in automated intrusion-response technologies.

Enterasys Networks Inc. last week started shipping new software that's designed to allow companies to drive this response down to individual users without disrupting the rest of the network.

Enterasys' new NetSight Atlas Automated Security Manager (ASM) works with the Andover, Mass.-based company's Dragon intrusion-detection system and its network switches.

Together, the products allow companies to automatically identify the network port from which an attack originates, quarantine individual users' machines that are vulnerable and make policy changes without broad disruption.

The ASM technology is the first to give companies this sort of granular control when responding to network attacks, according to Stan Schatt, an analyst at Forrester Research Inc. in Cambridge, Mass.

"This is a pretty powerful kind of improvement," Schatt said. With this technology, he added, "you are not going to have to cut off an entire port if you see an intruder."

The new capability builds on the intrusion-response functions already enabled by Enterasys, said Bob Hartland, director of IT at Baylor University in Waco, Texas.

The university is using Enterasys technology to apply policies and block certain kinds of traffic on its dormitory networks. "We apply policy to ports that blocks everyone with the policy group equally," Hartland said.

The more sophisticated response enabled by ASM will allow Baylor to apply such policies as needed at an individual user level, he said.

Eaton Vance Distributors Inc. in Boston is planning to use Enterasys' dynamic intrusion-response capabilities to monitor core applications.

"As a financial services company, we have to be very careful about who has access to what," said Vinnie Cottone, Eaton Vance's vice president of infrastructure services.

WHAT IT DOES

Enterasys ASM:

- Links Enterasys network switches and Dragon intrusion-detection systems.
- Enables automatic detection, location and disabling of threats.
- Enforces a security policy for different network segments independently on the same physical port.

Enterasys' technology will help the company become more proactive by "letting us know who's on our network, what kind of access they have and what they are doing with that access," Cottone said.

Enterasys' moves to incorporate more security functions in its network technology are similar to those being made by other vendors, most notably Cisco Systems Inc.

"What they are doing is integrating security into the infrastructure itself from a switching perspective," Schatt said.

Pricing for Enterasys' NetSight ASM v1.0 technology starts at $17,000 and includes the NetSight Atlas Console v1.4. 46890

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Bluetooth Vendor Group Downplays Security Risks

But backers of wireless technology say detection feature should be turned off

BY BOB BREWIN

BLUETOOTH advocates last week dismissed growing security fears about the short-range wireless technology, saying any flaws are limited to a few mobile-phone models. But they also detailed steps that users can take to secure Bluetooth devices.

For example, officials from the Bluetooth Special Interest Group (SIG) agreed with a recommendation by phone maker Nokia Corp. that users should turn off a feature that lets Bluetooth-equipped devices detect one another.

"Always make sure your devices are not discoverable," Mike McCamon, marketing director of the Bluetooth SIG, said during a teleconference that the Overland Park, Kan.-based trade group held to discuss security issues. He also suggested that device names programmed into Bluetooth phones shouldn't readily identify their owners.

The advice from McCamon and other Bluetooth SIG members came in response to security worries that have prompted some IT managers to impose limitations on the use of Bluetooth products on their networks [QuickLink 46757].

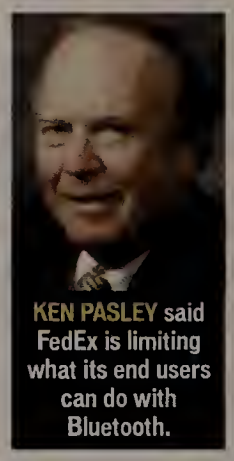
Locking Down Capabilities

Ken Pasley, director of wireless business development at FedEx Corp., said he has taken extra steps to "lock down" the Bluetooth capabilities in 40,000 PowerPad mobile PCs that the package delivery company plans to start distributing to its couriers next month.

Pasley said FedEx has developed proprietary bar-code key technology to block unwanted pairing of Bluetooth devices and ensure that the PowerPads can link up only to assigned printers.

In addition, the technique prevents interference problems when groups of couriers synchronize their PowerPads with printers at the start of a workday, he said.

McCamon said that only some of the phones made by Nokia and Sony Ericsson Mobile Communications AB are susceptible to the potential security threats. The at-risk phones include Sony Ericsson's R520m, T68i and T610 models and Nokia's 6310, 6310i, 8910 and 8910i devices.



KEN PASLEY said FedEx is limiting what its end users can do with Bluetooth.

Security holes in the phones can be exploited to bypass the pairing process and access personal data, a technique known as bluesnarfing, said Nick Hunn, sales managing director at TDK Systems Europe Ltd. in London.

Both Nokia and Sony Ericsson are developing patches for the older phones and have said that their newer models won't be vulnerable to bluesnarfing, according to Hunn.

Nokia said in a statement that it plans to release a patch for its vulnerable phones this summer. The company added that bluesnarfing poses only a minimal threat to users.

But Adam Laurie, CEO of A.L. Digital Ltd., a network security consulting firm in London, said the Nokia 6310 and the Sony Ericsson T610 are two of the most popular mobile phones in Europe. The 6310 is also sold in the U.S. by AT&T Wireless Services Inc., noted Laurie, who discovered the bluesnarfing vulnerabilities earlier this year.

Joseph Dell, chief technology officer at IT security services firm Vigilar Inc. in Atlanta, said users should view all Bluetooth devices as inherently insecure. He recommended that companies scan their networks for unauthorized devices and secure approved ones by using encryption and turning on only needed features. **46859**

MORE ON THIS TOPIC

In this issue: It's time to start thinking about how you're going to manage Bluetooth devices, writes columnist Robert L. Mitchell: **Page 29**

Online: Bank of America is testing a Bluetooth-based system that uses fingerprints to identify customers:

QuickLink 46826
www.computerworld.com

Continued from page 1

Governance

said he expects other companies to take similar steps as executives start to examine the legal risks that IT investments pose under the financial reporting requirements of the Sarbanes-Oxley Act.

"This is an area where boards of directors will be named in stockholder suits," said Nolan, a management professor at the University of Washington Business School in Seattle. He spoke about the issue of board-level IT governance at a conference held this month by consulting firm Cutter Consortium. (See related story, page 19.)

Novell's oversight committee, which also includes four other directors from outside the company, monitors major projects and decisions about Novell's technology architecture. Nolan said its duties also include working with senior IT executives and addressing questions such as whether Novell is getting adequate returns from its technology investments (see box).

Having directors oversee IT activities "is an enforcing function," Nolan said. "This can shine a light on issues."

FedEx created an IT oversight committee four years ago that includes board members. Like Novell's committee, the one at FedEx oversees major IT-related projects and architecture decisions and advises both the senior IT management team and other board members on technology issues, according to a spokeswoman for the Memphis-based company.

Steering Committees

Over the past few years, many large companies have created IT steering committees to help prioritize funding for high-cost projects. But most of those committees are made up of business unit leaders and department heads, and they don't include board-level participation beyond senior executives such as CEOs and chief financial officers.

For instance, KeySpan Corp. established an IT governance board early last year, said Frank La Rocca, co-CIO at the Brooklyn, N.Y.-based natural gas distributor, electric utility and energy services firm. The panel, which meets monthly to scrutinize IT investments, includes KeySpan's CFO and chief strategy officer, plus several executive vice presidents and business unit heads. But no external directors are members at this point, La Rocca said.

Board-level IT governance and oversight committees are just beginning to emerge, said Tom Pohlmann, an analyst at Forrester Research Inc. in Cambridge, Mass.

"There are many cases where the CIO presents to the board of directors once or twice a year," he said. "But overall, this is not a trend that I'm observing."

Steve Bandrowczak, CIO at DHL International Ltd. in Scottsdale, Ariz., said he isn't sure whether IT governance at the board level will be widely adopted. DHL itself has yet to move in that direction, he noted.

"Most company board meetings have little time to cover IT strategy," Bandrowczak said. "That's not to say board meetings don't discuss major business initiatives that require a major IT project. But the two go hand in hand."

At Schneider National Inc., most IT decision-making "happens at the VP and CxO level without board involvement," said Bob Grawien, vice president of application development at the Green Bay, Wis.-based trucking firm.

Nonetheless, Grawien added, Schneider's board of directors would want to know what's happening in certain areas of IT, such as risk mitigation plans and the alignment of IT and business strategies. **46892**

IT Governance At Novell

The software vendor's board-level IT oversight committee:

OVERSEES major projects and IT architecture decisions.

PROVIDES guidance to Novell's senior IT managers.

MONITORS the effectiveness of internal IT security and disaster recovery capabilities.

ADVISES the full board on IT-related matters.

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Continued from page 1

N+I

products, with MCI announcing a technology partnership with Microsoft Corp. and Nortel disclosing a similar deal with Polycom Inc.

But MCI, which emerged from bankruptcy protection in April, also said last week that it plans to lay off 7,500 workers after losing $388 million in the first quarter.

Meanwhile, Nortel is being investigated by securities regulators in both the U.S. and Canada for possible accounting improprieties, and three weeks ago the company fired its CEO and two top finance executives [QuickLink 46579]. On Friday, Nortel disclosed that a federal grand jury in Texas has issued a subpoena seeking accounting records and other documents as part of a criminal investigation by the U.S. attorney's office in Dallas.

Some users at N+I said they are still behind MCI's network services and Nortel's networking equipment, despite the revelations. But several others weren't so sanguine.

For example, Fred Gratke, assistant vice president of telecommunications at The Burlington Northern and Santa Fe Railway Co. in Fort Worth, Texas, said MCI's accounting problems and latest layoffs have made him nervous about the vendor's customer service capabilities.

"Mr. Capellas should pay attention to reliability and should not ignore existing customers as MCI finds new business," Gratke said. He added that despite MCI's emergence from bankruptcy, he is "still not very confident" about the company and has no plans to expand the level of voice and data services that the railroad gets from MCI.

Gratke said BNSF uses several other telecommunications carriers for most of its voice and data traffic, but it has an agreement to give MCI rights of way for burying optical cable along railroad lines in return for network bandwidth.

Technology Deals

- **MCI will incorporate Microsoft's Office Live Meeting software into some of its business communication offerings, starting with its Net Conferencing service.**
- **NORTEL plans to team up with Polycom to offer videoconferencing tools based on the Session Initiation Protocol to corporate users.**

Ethics Concerns

Carl Schneider, systems manager at Gray & Co. in New Orleans, said he's gathering information from Nortel and other vendors on setting up a voice-over-IP (VoIP) system for the insurer's 14 branch offices.

But Schneider said he's worried about business ethics at Nortel in light of the executive firings and the ongoing government investigations. "It troubles me that I have to do a higher level of ethics scrutiny of my vendors," he said. "I mean, this is not my area — I'm an engineer. I should be learning about the VoIP technology and not some possible ethics problem."

To move forward with Nortel, Schneider said, he envisions having to sit down with the vendor's sales reps to learn exactly what Nortel is going to tell the U.S. Securities and Exchange Commission and Canadian regulators. He said he expects that business executives at Gray will want a full explanation of what has happened at Nortel before they approve any purchases of its networking equipment.

In comments to reporters after his keynote speech, Capellas identified reliability as the top concern of users and promised that it will be an ongoing priority for MCI (see interview, above).

Nortel's Collins said the vendor takes the investigations it faces "very seriously," but he wouldn't discuss any details of the probes. "We're having to allay the concerns of our customers," he acknowledged.

Another MCI customer had nothing but praise for the carrier as he visited its N+I booth.

"MCI's customer service is excellent and has gotten even better now when compared with five years ago," said Joseph Desantis, vice president of telecommunications at GreenPoint Credit LLC in San Diego. "Capellas has a lot ahead of him, but given time, MCI will be back up there."

46893

MCI Forced Into Layoffs, Says CEO

LAS VEGAS

MCI CEO **Michael Capellas** spoke with a group of reporters after his keynote address at NetWorld+Interop. Excerpts from his comments follow:

On MCI's announcement last week that it plans to lay off 7,500 workers in addition to the 4,500-employee cutback it announced three months ago: We had very rare, minimal layoffs [during the company's bankruptcy proceedings] to keep customer service up. But the industry requires [layoffs], which is sort of a given and has happened everywhere else. We've been very careful to put automated tools in place and very careful on customer service, our No. 1 priority. . . . Nobody ever likes layoffs. [But] we are adjusting to the economics in the industry.

On the prospects for a recovery in the telecommunications industry: The traditional notion of telecom recovery has been that as employment rises, telecommunications recovers. That's because the more jobs you have, the more phone lines you have and the more data lines you have. We do see employment starting to recover, but [it's not clear] whether it's sustained job growth. I think that job growth will be slower and that there will have to be an extended period of economic recovery before we see the job market pick up, because business is naturally cautious.

On what MCI users tell Capellas they want: There are [several] things on customers' minds. No. 1 is reliability – the notion is that customers take reliability as a given, but they do not. Customers still differentiate [between network service providers] on reliability. Second, they want multitiered security. Third, they want ease of use and to be able to add new applications, such as wireless applications and collaborative tools. And the last, of course, is cost, but cost pressures as a differentiator are starting to subside, and that's because [voice] rates are so low. So customers ask, "What are you going to do for me to add features and functions?"

On MCI's deal with Microsoft to jointly develop IP-based Web conferencing and collaboration services with integrated voice capabilities: This is where it starts. . . . But at the end of the day, we will completely embed telephony into the desktop with full streaming-audio and -video capabilities.

– Matt Hamblen

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Marketing Automation 4

SAS Institute Inc.

■ **PRODUCT SUMMARY:** At its annual user group conference last week in Montreal, SAS announced an upgrade of its software for automating the development of marketing campaigns. Marketing Automation 4 supports the SAS 9 data analysis infrastructure technology that the Cary, N.C.-based company released in late March [QuickLink 45904] and includes new role-based graphical user interfaces for end users as well as IT staffers. For example, IT workers can use a tailored GUI to manage information access, security and database administration, said Randy Betancourt, director of customer intelligence at SAS. They can now also directly manage the data associated with marketing campaigns.

■ **USER EXPERIENCE:** Beta tester Peter Clemente, senior vice president of CRM at Sony Corporation of America in New York, said his company chose Marketing Automation 4 because of the depth and breadth of its capabilities. The software gives Sony's marketing employees an end-to-end set of tools for measuring, tracking and analyzing customer information, Clemente said. Competitive forces and the fragmentation of advertising media are "forcing us to take a better look at how to build relationships with customers," he added. "There's a greater need to understand who our customers are."

■ **ANALYST ASSESSMENT:** Ian Jacobs at Current Analysis Inc. in Sterling, Va., said enabling Marketing Automation 4 to feed data to call center applications would give call center workers access to pop-up menus and scripts created as marketing campaigns were analyzed, letting companies fine-tune their sales approaches.

■ **OTHER VENDORS IN THE MARKET:** Aprimo Inc. and Unica Corp., plus CRM and ERP software vendors such as PeopleSoft Inc., Oracle Corp., SAP AG, Siebel Systems Inc. and Salesforce.com Inc.

■ **PRICE:** Starts at $500,000.

■ **AVAILABILITY:** The upgrade is shipping now. **46860**

– Marc L. Songini and Gary H. Anthes

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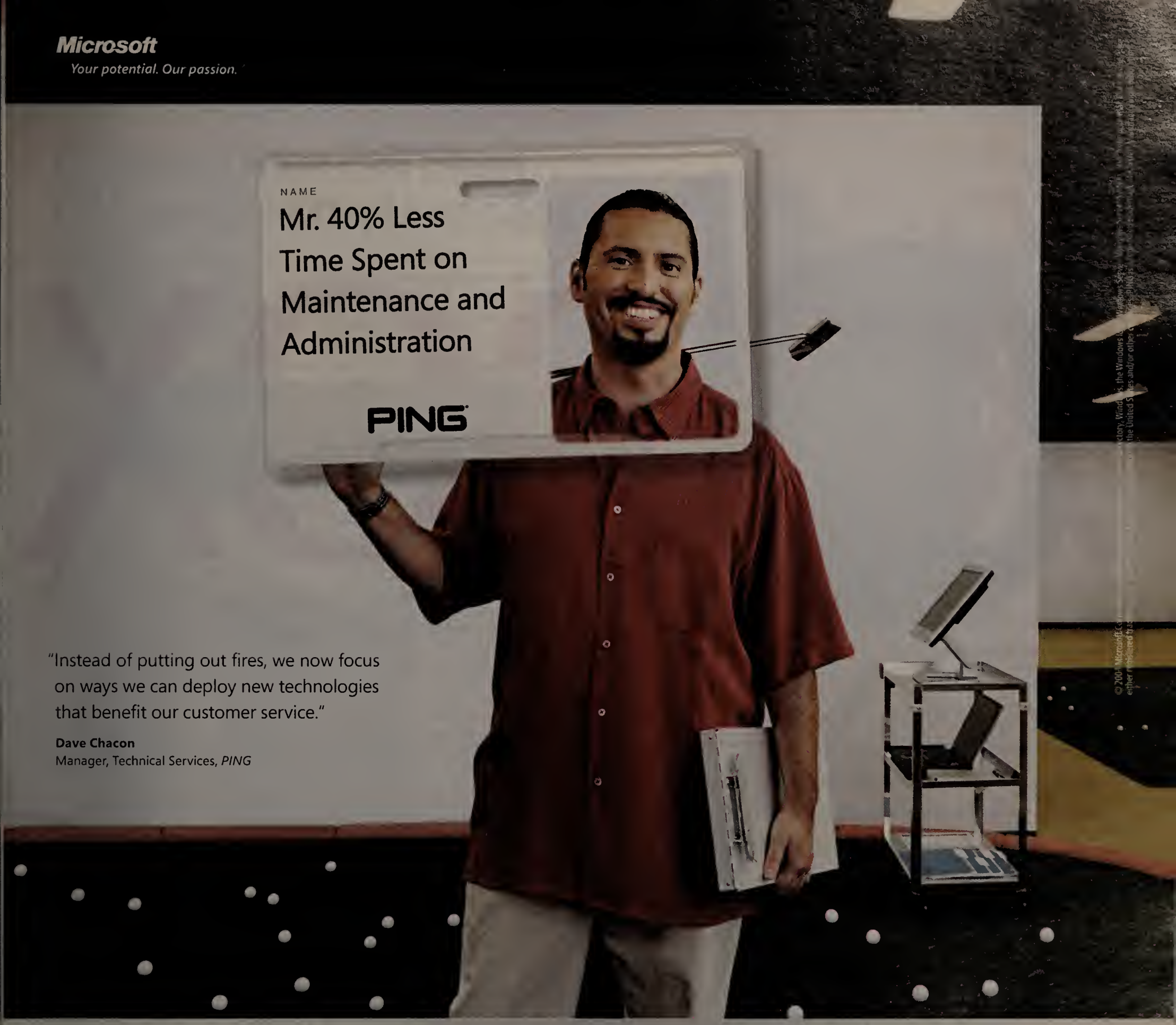

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Dave Chacon
Manager, Technical Services, *PING*

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IT Deals Often Fall Short Of Expectations, Users Say

Conference attendees cite problems with negotiations, execution

BY THOMAS HOFFMAN
CAMBRIDGE, MASS.

Attendees at a conference here this month said IT managers often end up getting less out of technology product and outsourcing contracts than they had hoped for, largely because of the process through which deals are negotiated and carried out.

Specific problems cited by IT executives and consultants include a lack of willingness on the part of vendors to go above and beyond the service levels spelled out in contracts, and the challenge of giving workers at IT services and outsourcing firms incentives to conscientiously meet agreed-to terms.

During negotiations, IT managers may "come up with great ideas to tie value to performance," said Todd Larson, director of application development at Eaton Vance Corp., a financial services firm in Boston. But by the time a contract is signed, "most of those ideas have dissipated," he added.

For example, Larson said one vendor he dealt with was reluctant to add performance metrics that went beyond the boilerplate agreement it was accustomed to using.

Larson was one of the attendees who discussed IT contract management issues at the conference, which was held by Cutter Consortium, an IT consulting firm based in Arlington, Mass.

Stuart Kliman, a senior consultant at Cutter and a partner at Boston-based Vantage Partners LLC, said one of the big problems that leads to what he described as contract "value leakage" is a lack of coordination within technology vendors.

"There are big gaps between vendor salespeople, contract managers and the people who deliver [products and services]," Kliman said.

In addition, many IT services contracts are hamstrung by the use of outdated performance metrics, said Michael Mah, another Cutter consultant and a partner at QSM Associates Inc. in Pittsfield, Mass.

"We're in a knowledge society, but we're using industrial-economy metrics," Mah said, referring to measurements such as output per unit cost.

Developing Vendor Ties

Some attendees said developing and maintaining close ties to vendors is a must, especially with outsourcing or IT services contracts.

"The relationship is the most important thing in an outsourcing deal," said Joseph Imbimbo, vice president of technology operations at Tufts Associated Health Plans Inc. in Waltham, Mass.

Imbimbo, who helped negotiate a seven-year, $20 million applications outsourcing deal with Keane Inc. in 2000, said IT managers can't sufficiently get to know vendors during a standard request-for-proposal bidding process. He added that he spent a year working with Boston-based Keane to craft the outsourcing contract.

A lot of time was spent on due diligence work to consider all the things that could go wrong under the contract and whether Tufts would be able to extricate itself if Keane failed to meet the specified performance targets, Imbimbo said.

Martha Crow, managing director of the New England region at Keane, said many of the consulting firm's contracts now contain an "above-and-beyond clause" that spells out extra duties for the firm's workers. Describing a hypothetical example, Crow said Keane might agree to specify as part of a contract that it has to "come up with 12 good ideas" each year for the customer to consider. **46719**

Preparing to Negotiate

DEVELOP training programs to ensure that IT staffers have the necessary negotiating skills.

CLEARLY IDENTIFY the roles and responsibilities of different workers in negotiations.

PROVIDE negotiators with both formal and informal performance incentives.

USE available software to help manage the negotiation process.

SOURCE: VANTAGE PARTNERS LLC, BOSTON

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MARYFRAN JOHNSON

Supply Chain Cure

FOLLOW THE MONEY in any business, and it will eventually lead you to the supply chain. Whether it's the flow of goods and services, finished parts or raw materials, an ever-growing network of partners and suppliers has turned supply chain expertise into one of IT's most business-critical accomplishments.

MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran_johnson@computerworld.com.

In the retail and consumer market, the supreme being known as Wal-Mart now calls the supply chain shots. Its RFID commandments for electronically tracking products are duly inscribed on thousands of boardroom tables now, and all the faithful are scrambling frantically to comply. The Yankee Group estimates that manufacturers will spend about $2 billion on electronic product code RFID tags and another $1 billion to $3 billion on consulting and systems integration in the next few years.

But in another vital industry — one that does far more important work than Wal-Mart — there is no all-powerful entity to drive standards or dictate coordination in the workings of the supply chain. The health care industry is actually something of a disgrace in this realm, wasting an estimated $11 billion as a result of supply chain inefficiencies last year. As Julia King reported in her front-page story last week ["Health Care's Major Illness," QuickLink 46091], none of our 5,000 hospitals and health care systems is influential enough to push standards for describing, tracking or purchasing the products they use. Hospitals are "downright dinosaurian when it comes to deploying IT to better manage the supply chain," she wrote.

Part of this Jurassic problem is infrastructure-related. Very few hospitals have integrated systems for ordering, tracking and paying for supplies, says Lee Marston, CIO at Broadlane Inc., a health care software and services company in San Francisco. In a yearlong analysis of all the supplies purchased by one of its multihospital clients, Broadlane discovered that overall the chain spent more than eight times what it would have spent — we're talking millions here — if the same stuff had been acquired at coordinated, contracted prices.

Also playing a role in this problem is the questionable bliss of ignorance about how much money is being left on the table, since about half of all medical supplies are bought outside negotiated contracts. Fixing the problem with technology is (like so many things in IT) easier said than done. The prescription includes ingredients like common computing platforms, integrated systems, standard product descriptions, constant data cleansing and much more.

Although the supply chain battle is going rather badly in health care, there are some hard-won victories out there. Our story profiled two hospitals that fixed broken supply chains. While their efforts were complex and time-consuming and required essential business process changes, they did save money and even improved patient care.

For example, Allina Hospitals & Clinics in Minneapolis used a Y2k overhaul to merge six systems into a common materials management operation that ultimately saved millions. "With a common system, we finally had a stadium to play the supply chain game in," said Scott Grove, director of IT at Allina. Attaining real supply chain efficiencies in health care turns out to be "a heavy maintenance issue of keeping data clean," he added. "If you can do that, you then have accurate information."

Hmm. Clean data, integrated systems and trusted, accurate information. Remind you of anything? It makes me wonder if compliance with HIPAA and other regulations could end up delivering an unexpected upside for health care. Maybe even a supply chain cure. **46863**

MICHAEL H. HUGOS

Making IT a Profit Center

IT'S GREAT to use IT to cut costs, but people expect that. How can IT be used to increase your company's revenue? How can IT be used to differentiate your company from similar ones? How can IT be used to better please the people your organization serves?

Think about this: How can you employ IT to enhance the value of your company's products or services by adding additional features that your customers will value? Let me illustrate the idea. I work for a company that sells basic commodity products: food service disposables such as paper cups, napkins and plastic spoons, and janitorial supplies such as mops, floor wax and paper towels. Our customers can buy these things from many suppliers. One of the main reasons they buy from us is that we use IT to significantly increase the value of the products we sell.

MICHAEL H. HUGOS is CIO at Network Services Co., a distribution cooperative in Mount Prospect, Ill., that sells food-service and janitorial supplies. He is the author of *Essentials of Supply Chain Management* (John Wiley & Sons Inc., 2003). He can be reached at mhugos@nsconline.com.

When customers buy from us, they get a customized package of value-added services that fit their specific operating needs. They can order using our Web-based order entry system or their EDI systems. They can use XML or FTP. Or they can phone or fax us. They get daily updated sales history reports through our Web site that show their usage of our products at each of their locations, by supplier, product and volume over any time period, from one day to three years. To bill customers, we can send them electronic invoices or statement billings in any format they need in order to automatically import them into their accounts payable systems. We format and preprocess the invoices or statement bills to insert whatever special general ledger codes or other data their accounting systems may require.

All of these services enhance the value of our products. We work with

customers to enable them to control who in their company orders our products and which products they can order. We then provide them with sales information that lets them do a much better job of planning and budgeting their purchases and monitoring daily usage of our products. We help them streamline their back-office accounting procedures. We even provide customers with weekly or monthly report cards that track our performance against certain agreed-upon key performance indicators.

These services enable us to provide tangible proof that we do indeed lower customers' overall costs. And all of these services required IT in order to become a reality.

Because of these services, we don't have to compete on price alone. Our prices need to be close to those of our competitors, but we don't need the lowest prices to win new business. In this way, IT delivers part of all the products we sell. IT helps my company actively manage its profit margins.

Try this: Write up a description of the value-added services your existing IT infrastructure can add to the products or services your organization provides to its customers. Work with managers in your sales department to educate salespeople about these value-added services and train them in how to spot opportunities to sell these services to customers. When salespeople ask you to come out and meet customers and help them win new business, you will know that you have succeeded in jump-starting your career. Through helping your company add new value to its products, you have added new value to yourself. And, unlike my company's paper cups, you're no longer a commodity. **46595**

THORNTON A. MAY

Demographics And IT Team Performance

CONCURRENT research from UCLA's Managing the Information Resource program and Ohio State's CIO Solutions Gallery indicates that 85% of the high-value work of IT is conducted by teams.

A major driver of team effectiveness (as measured along three dimensions: output, learning and satisfaction) is team design. Everyone seems to be talking — actually, shouting — about IT geographics: Where is the IT team going to do the work? But the more significant issue regarding team performance is demography. A well-managed team that is racially, sexually and generationally diverse will materially and consistently outperform a well-managed team that is homogeneous when performing tasks that call for adding structure to chaos or generating momentum from ambiguity.

THORNTON A. MAY is a longtime industry observer, management consultant and commentator. Contact him at **thorntonamay@aol.com.**

The IT leader of the future will need to be prepared to manage cross-culturally and cross-generationally, if the projections of the U.S. Census Bureau are valid. They will find that generations don't just define stages of life, from youth through young and unmarried, and on to coupled and raising children, and then to mature empty-nester. Generations can also be correlated to the states of mind (beliefs, values, preferences and behaviors) that people have at a given stage of life.

Here are some of the highlights from Demography 101:

(Note: The Census Bureau is the source of the broad demographic information; IT-specific information is culled from the UCLA research, other research from UC-Berkeley and research for the "CIO Habitat Report.")

U.S. POPULATION BY RACE

In IT shops participating in the recent CIO Habitat Study, 65% of the IT employee base was white, closely mirroring current national demographics.

	2000	2050
White	71%	53%
Hispanic	12%	24%
Black	12%	13%
Asian	4%	9%
Other	1%	1%

U.S. POPULATION BY AGE

Demographers don't all agree on when a certain generation starts and stops. Generation gurus will tell you that you typically find as much as a seven-year overlap. There is not one hard-wired point in time that designates the end of one generation and the beginning of another.

	BIRTH YEAR	COHORT SIZE	DISTRIBUTION IN IT SHOPS
Gen Y	1980-2000	70M	11%
Gen X	1961-81	49M	59.4%
Baby boom	1946-64	76M	29.6%

The path to effective demographically informed management begins with awareness. As you prepare to assemble world-beating teams, you need to be aware of the following factors:

- Mind-set (how the team members think).
- Communication style (how they prefer to process information).
- Foundational values (what really matters to them).
- Attitudes toward and preferences regarding authority (how they work with others).

The workplace of the future will be a rich stew of cultures, values, beliefs and ages. Two questions for you: Do you know how to "cook" demographically, and will you have the ingredients (that is, the diversified workforce) to do so? **46681**

WANT OUR OPINION?

More columnists and links to archives of previous columns are on our Web site: **www.computerworld.com/columns**

READERS' LETTERS

Key Piece of Cisco Pricing Info Missing

AFTER READING the April 26 article "Cisco's Prices Seen as a Fair Trade-off" [QuickLink 46376] and the sidebar on Cisco R&D chief Mario Mazzola's rationale for the company's pricing premium [46377], I had to wonder about the omission of any mention of Cisco's Smartnet contracts.

Although Cisco claims that a newly purchased product has (in some cases) automatic 90-day tech support coverage, I have found this not to be true. Although my corporation has purchased Cisco products almost exclusively, chiefly on my insistence, I was given the runaround on a critical question about a newly purchased PIX 535 until I was finally told I needed to purchase a Smartnet contract to have someone answer my question. To me, this amounts to a forced-purchase warranty.

Beyond the pricing premium for Cisco's admittedly superior products, anyone purchasing Cisco equipment realistically had better factor in a Smartnet contract.

David B. Libby
Vincennes, Ind., dlibby@charter.net

Outsourcing Rarely Has Good Results

WHILE I recognize that Pimm Fox's recent article "Don't Own Your IT" [QuickLink 46067] is an opinion piece, I feel it bordered on the level of irresponsibility of Nick Carr's *Harvard Business Review* article "IT Doesn't Matter." Fox leads readers to believe that outsourcing IT "systems" is the right thing to do. This simply isn't true. He uses H&R Block as an example and states that the company "doesn't have an IT department keeping an eye on things." If this is true, then what does Jeff Brandmaier, H&R Block's senior vice president and CIO, do to keep busy? Last I checked, he still had a job.

On a regular basis, I hear of outsourcing cases gone bad. True, I also hear favorable stories, involving both on- and offshore outsourcing. However, let's not forget that the systems that get outsourced often automated the very processes that make a business a business and also house the family jewels – the data. Moving into outsourcing is a form of specialization and economic evolution, no doubt, but doing it recklessly is irresponsible and negligent. As a related aside, we hear of very few "application maintenance outsourcing" cases that go well.

Robert Handler
Vice president, Meta Group Inc., San Diego, Robert.Handler@metagroup.com

Offshoring Yields Net Loss for U.S.

THE NET RESULT of the trends described in the story "More IT Jobs to Go Offshore, Controversial ITAA Report Says" [QuickLink 45933] is the loss for the U.S. of jobs, income and tax dollars, and the companies sending jobs offshore will eventually be tarnished for their cowardice as traitors to American citizens.

Gary Gaunnac
Project manager, Scientific Systems Consulting LLC, Indianapolis, gaunnac@lightdog.com

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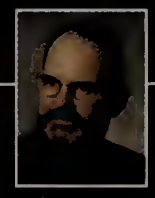

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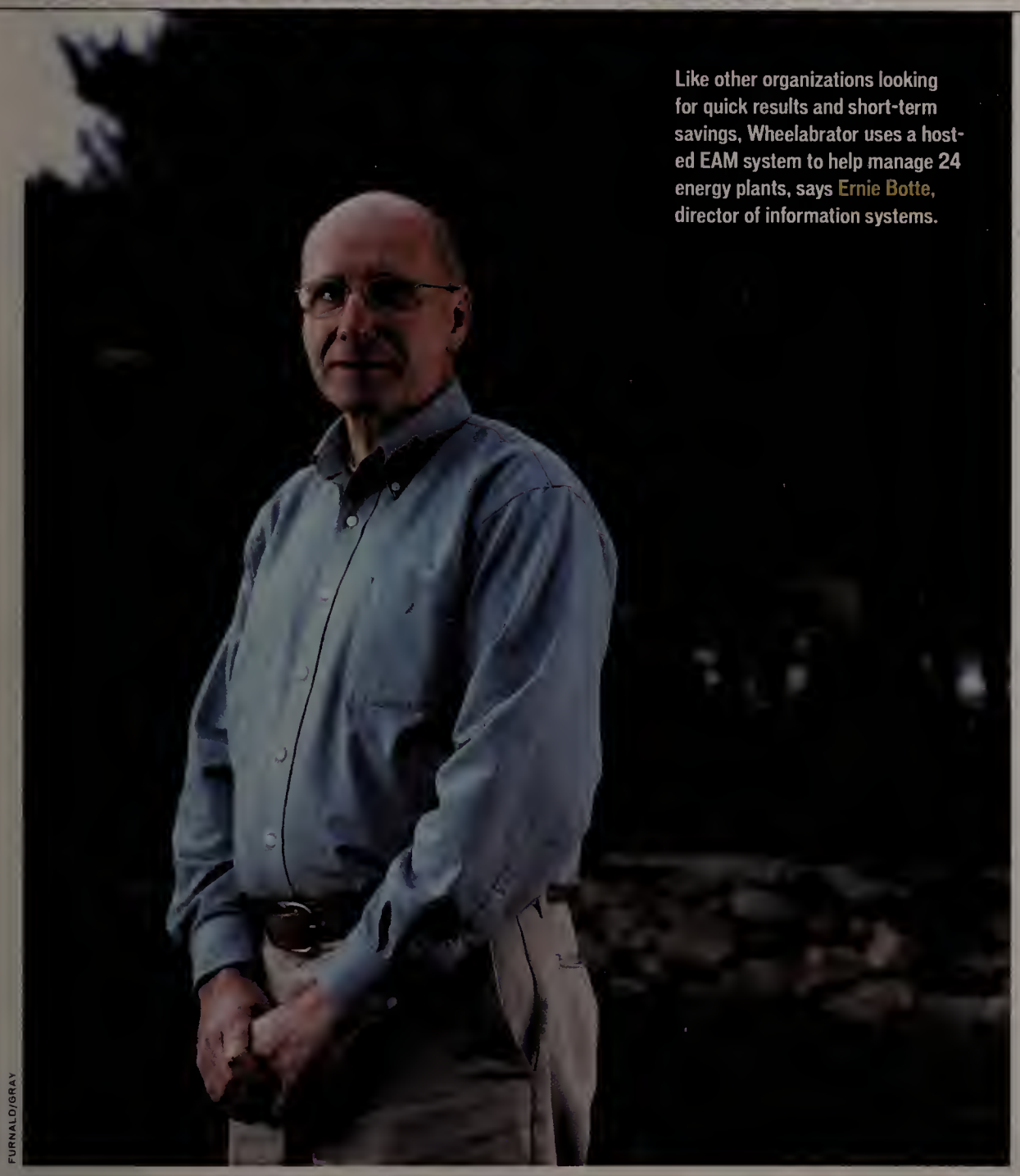

FURNALD/GRAY

Like other organizations looking for quick results and short-term savings, Wheelabrator uses a hosted EAM system to help manage 24 energy plants, says Ernie Botte, director of information systems.

ASSET MANAGEMENT Moves Out

More companies are outsourcing their EAM systems to speed implementation, cut costs and take pressure off of downsized IT staffs. By Sue Hildreth

WHEN YOU'RE IN CHARGE OF IT for 17 energy plants — each responsible for converting up to 3,000 tons of waste into electricity every day — you don't want each plant to use a different format for critical maintenance data.

But that was the situation four years ago at Wheelabrator Technologies Inc., a $1 billion subsidiary of Waste Management Inc. in Hampton, N.H. The fast-growing company was adding plants rapidly but lacked adequate standardization of data and processes.

"They were all doing things slightly differently," explains Ernie Botte, director of information systems at Wheelabrator. "If I went to look for a furnace grate, it might have different part numbers, so I might not be able to tell what's in the inventory."

That lack of standardization threatened the company's ability to keep furnace downtime to a minimum — which could have hurt its bottom line: "If we're not running our furnaces, we're not making any money," Botte says. So he set out in search of an enterprise asset management, or EAM, system.

EAM combines functions involved in purchasing, maintaining and tracking corporate assets, such as plant equipment, cash registers or delivery trucks. EAM includes maintenance functions, such as scheduling repairs, as well as purchasing activities, such as putting out bids and proposals. It also has analysis tools to track how key numbers — such as emergency repairs per month — are meeting goals. And it provides a unified view of all enterprise assets so that companies with far-flung facilities can centralize and optimize the purchasing, usage and maintenance of those distributed assets. An EAM product may be stand-alone, with loose integration to an ERP, inventory, purchasing or other enterprise application, or it may be tightly integrated with, or even part of, an ERP suite.

In Botte's case, integration with Wheelabrator's J.D. Edwards ERP system was less of a concern than getting features that met Wheelabrator's specific operational needs. For instance, he wanted to create corrective work orders so that when a technician found that a repair was different than specified in the original work order, he could quickly issue a corrective order instead of resubmitting a new one. "There was a host of those kinds of criteria," Botte says. In the end, Wheelabrator chose TabWare from Greenville, S.C.-based AssetPoint.

Then came the challenge of implementation. That's when Botte decided to do something that's becoming more popular at large companies: He opted not to bring the software in-house. Instead, Wheelabrator subscribed to TabWare OnLine, AssetPoint's hosted version. "We have eight people in IT. We don't have the skill sets to run it ourselves," says Botte.

An in-house implementation would require Wheelabrator to hire two additional IT people, as well as purchase Oracle database software to store the Tab-

Continued on page 28

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SORTING OUT THE ACRONYMS

CMMS, EAM Or ITAM?

EAM is a close cousin of **CMMS, or computerized maintenance management systems**, which are used for setting maintenance schedules, tracking parts and generating work orders for plants. EAM expands on CMMS by providing a centralized view of assets and associated resources across multiple facilities. It also includes analysis tools to evaluate how well assets are being leveraged. For instance, an EAM system might track how often an expensive maintenance tool gets used in a year or how much a leased asset generates in service revenue per month.

Ernie Botte, director of information systems at Wheelabrator, plans to use the information gathered by his TabWare EAM application to streamline asset management at Wheelabrator's 24 power plants. "If one facility is excelling, I can capitalize on what they're doing to improve the other facilities," he says.

ITAM, or IT asset management, is a subset of EAM. For some companies – such as IT services or technical management firms – ITAM is essentially EAM. For instance, Englewood, Colo.-based CH2M Hill, which provides management services to government and industry, uses Peregrine Systems Inc.'s AssetCenter for cradle-to-grave management of its many laptops, printers and other IT assets.

"We are very project-driven and need to know where equipment is and when it will be available for the next project," says Susan McCarthy-Rice, an IT business systems analyst at CH2M Hill.

– Sue Hildreth

Continued from page 25

Ware data and pay maintenance fees for the software. "We were probably looking at $2 million upfront," says Botte, with yearly expenses as high as $300,000 — compared with the roughly $500,000 he pays annually for hosted EAM.

Today, Wheelabrator uses TabWare to manage all of the parts and tools needed to maintain 24 plants in Florida and elsewhere on the East Coast, as well as in Spokane, Wash. "We rely on it to make sure that all components are in stock, and to keep our inventory to a minimum by sharing components across plants before we buy," he explains. "We'll also monitor metrics — such as inventory valuation, number of [product orders], inventory turns. It will give us performance measurements across the company."

Why Outsource?

Wheelabrator is an example of how some organizations seeking to better manage expensive assets are turning to application service providers (ASP) for help in implementing EAM.

Houghton Leroy, an analyst at ARC Advisory Group Inc. in Dedham, Mass., predicts that one in every four EAM installations will be externally hosted within five years. "ASP hosted solutions are used by all sizes of companies looking to outsource these expensive internal support costs," he says.

There are several reasons why a company might opt for hosted EAM, even if it isn't outsourcing other applications. For instance, it might need to get runaway equipment costs under control. An ASP can help get a system up fast, sometimes as a stopgap measure until EAM can be implemented in-house.

"They may say, 'All my inventories are out of whack, and I need to get this addressed today,' " explains Marc McCluskey, an analyst at AMR Research Inc. in Boston.

Another reason is that EAM is often viewed as a one-off function that's not well supported by internal IT staff. Such was the case at Maritz Inc., a $1.44 billion management and marketing firm in St. Louis. Bill Wright, administrative supervisor in facility services at Maritz, recalls that before he moved to a host-based EAM package in 2002, he served as tech support for his department's stand-alone maintenance management application. "Our IT folks didn't know a lot about the software, so we had to support it on our own," he says.

And when Wright's staff was downsized three years ago, so was his ability to support the software. So Wright went with Datastream Systems Inc.'s 7i software, paying $52,600 for implementation, plus a monthly fee of about $1,200 ($150 per user) for hosting at a data center under contract with Datastream.

Some companies host out their EAM system when the project is simply too large for internal IT to handle. Hanover Compressor Co., a $1.1 billion provider of natural gas compressors and compression services in Houston, acquired more than 40 companies in 10 years, all of which had their own enterprise applications. The company needed to integrate and standardize its systems — and do so quickly, says Stephen York, Hanover's corporate controller and vice president.

"When I came on board in 2002, the company had 68 applications, so it was a bit of a nightmare from an information perspective," York recalls. The asset management system was three separate databases tied to a homegrown asset-tracking application. "It wasn't really EAM, but just a way to keep track of our fleet of compressors," he explains.

York decided to move the entire company to Oracle Corp.'s E-Business Suite, which contains an EAM component. And he opted to have it hosted from Oracle's Austin data center because of the huge scope of the task of unifying dozens of companies in nine international locations on one ERP and EAM platform in 16 months.

"Our staff was busy keeping the old technology running, as well as preparing our network for the change. We didn't have the expertise," York explains.

With a subscription model, a company pays a monthly fee for everything — software, hardware and management. With a traditional hosting arrangement, the customer buys the software but pays a monthly fee for the management. Hosting is generally cheaper on the front end but could be more expensive over the long haul. A key factor is how much of the hardware, software and expertise a company already has.

Durand Glass Manufacturing Co., a Millville, N.J.-based division of Arc International Group, chose in-house implementation of MRO Software Inc.'s Maximo asset management application because Durand already had a Unix server and the Oracle 8i software to host the EAM database. Project manager Fabien Klimsza says that Durand's staff did most of the implementation, with some help from Bedford, Mass.-based MRO. The total costs — training and consulting services, licenses and a Dell Inc. Windows 2000 server — added up to about $300,000.

"We did not incur any real incremental increase, so it would have been difficult to justify the cost of hosting," explains Klimsza.

Giving Up Control

Another trade-off is control over upgrades. A renter has less control than an owner has. Says Botte, "When you buy an application, you can defer an upgrade. But with an ASP, everybody online gets the new version."

Integration may also be a factor. If all a company needs to do is update batches of data, such as new purchases, over to the ERP system, then integration isn't terribly complicated. Wheelabrator, for instance, uses simple file updates to integrate its internal finance and TabWare systems.

But integration is critical if a company has sophisticated, overlapping processes between its EAM and ERP systems. "If you've got a maintenance schedule and need real-time fulfillment of parts and people and you use both EAM and ERP applications [for those processes], then you need tight integration, or you'll be double-purchasing items," says McCluskey.

And then there's the question of downtime. Most ASP and hosting contracts spell out how much downtime is allowed. But, ultimately, it's under an outsider's control. "When you go outside, it introduces another layer of infrastructure," says Botte. "When something goes down, we have to ask if it's my infrastructure or TabWare's, and you just hope the finger-pointing is minimal."

Botte says he's happy with TabWare, and with the assurance that he could also opt to buy the software and implement it in-house in the future. "One of the positives with TabWare was the ability to go either way," he explains.

As with any major IT investment, he says, it's always safest to keep your options open. **46631**

Companies Offering Hosted EAM Systems

- **AssetPoint**, www.assetpoint.com
- **Datastream Systems Inc.**, www.datastream.net
- **Indus International Inc.**, www.indus.com
- **MicroMain Corp.**, www.micromain.com
- **Mincom Ltd.**, www.mincom.com
- **MRO Software Inc.**, www.mro.com
- **Oracle Corp.**, www.oracle.com
- **Peregrine Systems Inc.**, www.peregrine.com

Hildreth is a freelance journalist in Waltham, Mass. She can be reached at Sue.Hildreth@comcast.net.

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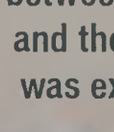

Doug Busch, CIO, Intel

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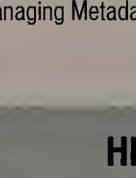

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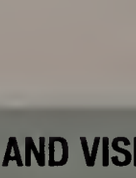

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MONDAY, SEPTEMBER 27

10:00am - 9:00pm	Registration Open
Noon - 5:00pm	Pre-Conference Golf Outing
7:00pm - 9:00pm	Welcome Reception

TUESDAY, SEPTEMBER 28

7:00am - 8:30pm	Registration Open
7:00am - 8:00am	Buffet Breakfast
8:00am - 11:00am	Opening Presentation and General Sessions

Keynote Speaker
Andreas S. Weigend, Ph.D.
former Chief Scientist, Amazon.com

11:00am - 12:30pm	Concurrent End User Case Studies
12:30pm - 2:00pm	Networking Luncheon
2:00pm - 4:45pm	General Sessions
5:30pm - 8:30pm	Expo with Buffet Dinner

WEDNESDAY, SEPTEMBER 29

7:00am - 8:00pm	Registration Open
7:00am - 8:00am	Buffet Breakfast
8:00am - 11:00am	Opening Presentation and General Sessions

Keynote Speaker
Cecilia Claudio
EVP and CIO, Zurich Financial Services

11:00am - 12:10pm	Concurrent End User Case Studies
12:10pm - 1:30pm	Expo with Buffet Lunch
1:30pm - 5:00pm	General Sessions
6:00pm - 8:00pm	Gala Evening

The Palm Course
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Pre-Conference Golf Outing

Monday, September 27, Noon

Complimentary for Registered IT End-Users

The Pre-Conference Golf Outing at The Palm Course, located at the JW Marriott Desert Springs Resort, is complimentary ($85 value) for registered IT End-Users. (Other participants, including sponsors and vendors, may play on an "as available" basis and are responsible for all applicable golf outing expenses.)

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Please check ONE of the following:	Earlybird Registration (through July 26, 2004)	Pre-Conference Registration (after July 26 through August 16, 2004)	Full/Onsite Registration (after August 16, 2004)
❑ **I am an IT End-User**	❑ **$995** General Conference Package (includes General Conference Sessions, Expo, Meals & Receptions)	❑ **$1295** General Conference Package (includes General Conference Sessions, Expo, Meals & Receptions)	❑ **$1495** General Conference Package (includes General Conference Sessions, Expo, Meals & Receptions)

IT End-Users are defined as those who are attending Business Intelligence Perspectives with an intent (and an IT spending budget) to potentially buy/lease hardware/software/services, etc. from our conference sponsors and are not themselves an IT vendor. As such, account representatives, business development personnel, analysts, and anyone else attending who does not have IT purchasing influence within their organization are excluded from the "IT End-User" designation. Interpretation and enforcement of this policy are at the sole discretion of Computerworld.

Attendee Profile: This section must be completed by IT End-Users only (optional for all other registrations) in order to process your application.

Your business/industry:
- ❑ Transportation / Utilities
- ❑ Mining / Oil / Gas
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- ❑ Accounting
- ❑ Insurance
- ❑ Real Estate
- ❑ Telecommunications
- ❑ Wholesale / Retail (non-computer)
- ❑ Computer Service Provider
- ❑ Advertising / Marketing / Public Relations
- ❑ Entertainment
- ❑ Education
- ❑ Food Industry
- ❑ Government / Military
- ❑ Healthcare / Medical Services
- ❑ Travel /Hospitality / Recreation
- ❑ Manufacturing (non-IT)
- ❑ Automobile
- ❑ Computers, Communications or Penpheral Equipment or Software Manufacturing
- ❑ Agriculture / Forestry / Fisheries
- ❑ Other

Your job title/function:
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- ❑ CIO/CTO
- ❑ VP/GM/Director
- ❑ IS/IT Director/Manager
- ❑ Other IS/IT Department Manager/Supervisor
- ❑ Other Corporate/Business Manager
- ❑ Corporate/Business Staff
- ❑ Consultant (Internal) or Other

The one item that best describes your involvement in the IT purchase process:
- ❑ Authorize the purchase
- ❑ Approve the budget
- ❑ Initiate the purchase
- ❑ Evaluate / recommend products, brands, vendors
- ❑ Identify / establish the need to purchase

Number of employees in your entire organization (ALL locations):
- ❑ Over 10,000
- ❑ 5,000 - 9,999
- ❑ 1,000 - 4,999
- ❑ 500 - 999
- ❑ Under 500

What is the estimated annual revenue of your entire organization?:
- ❑ Over $10 Billion
- ❑ $1 Billion - $9.9 Billion
- ❑ $500 Million - $999 Million
- ❑ $100 Million - $499 Million
- ❑ Under $100 Million

Your organization's annual IT/IS budget for all IT/IS products:
- ❑ Over $1 Billion
- ❑ $500 Million - $999 Million
- ❑ $100 Million - $499 Million
- ❑ $10 Million - $99 Million
- ❑ $1 Million - $9.9 Million
- ❑ Under $1 Million

What is your organization's primary vendor for BI/data management solutions?:
- ❑ SAS
- ❑ Cognos
- ❑ Business Objects
- ❑ Oracle
- ❑ SAP
- ❑ Peopelsoft
- ❑ Other

What is your organization's most mission critical project within BI / data management this year?:
- ❑ Creating the vision and strategy- Analyzing ROI
- ❑ Planning, designing, building the BI infrastructure
- ❑ Building / managing the operational information stores
- ❑ Retrieval and reporting: BI, ERP, CRM, SCM, eCommerce
- ❑ Data visualization, prediction and presentation
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Would you like to receive information about playing in the golf outing on Monday, September 27th?
❑ Yes ❑ No

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3) The registration fee will be refunded, less a $250 service charge (if written notice is received by September 3, 2004).

Please send cancellation requests via email to: bipreg@computerworld.com

BRIEFS

WebSphere Portal Gets SAP Plug-ins

IBM has created portlets to make it easier to connect SAP AG applications to the WebSphere portal application. The portlets, which are available from IBM's online portal catalog as free upgrades to current customers, have been added to the WebSphere Portal Application Integrator to provide SAP self-service human resources and management features to WebSphere, said IBM.

Vendor Upgrades Sarb-Ox Software

Last week, OpenPages Inc. introduced the latest version of its Sarbanes-Oxley Act compliance software. New features in SOX Express Version 3 include tighter integration with third-party reporting tools such as Cognos Inc.'s ReportNet, improved data-import features and enhanced audit-trail tracking capabilities to help organizations attest to their IT and financial controls, according to the Waltham, Mass.-based company. SOX Express Version 3 starts at $1,995 per user.

Itronix Launches Rugged Handheld

Itronix Corp. has released an ultrarugged trimode wireless handheld computer for mobile workers. The G-Book Q-200 meets or exceeds military test specifications for shock, vibration and water and moisture protection, according to the Spokane, Wash.-based company. The Q-200 runs Windows CE and includes support for up to three wireless networks: cellular networks, 802.11b LANs and Bluetooth short-range communication. It can be configured to support applications such as automatic meter reading. The suggested retail price for a bare-bones Q-200 without wireless is $2,295; a model that supports three wireless modes costs about $3,500.

ROBERT L. MITCHELL

Bluetooth at the Gates

IT WAS THE PERFECT SETTING for the meeting, I thought. Outside, in Boston's historic Fanueil Hall marketplace, the peddlers offered souvenirs and other tchotchkes from their carts. As I walked inside the Kingfish Hall restaurant, a group of vendors had a somewhat different, and much fancier, set of gadgets on display.

This was demo day for the Bluetooth Special Interest Group, and several vendors had come to show off products that support the wireless personal-area network technology.

ROBERT L. MITCHELL is *Computerworld*'s senior features editor. Contact him at robert_mitchell@computerworld.com.

While Bluetooth has done well in Europe's vibrant cell phone market, it has a much smaller presence in the U.S., especially for corporate use. But Bluetooth is one of those consumer technologies that could easily come in the back door in a big way, much as PCs and PDAs did. So I wondered whether it was gaining popularity among individuals — and if it was, what sorts of disruptions it might cause as users bring it into the office.

Judging by the number and types of products on display, corporate IT concerns may be less urgent than I had thought. Although the SIG has some 3,000 members, only seven showed products at this regional event, and the wares were mostly Bluetooth-enabled cell phones, hands-free headsets and other consumer-oriented fare.

Wireless headsets from Plantronics Inc. and GN Netcom Inc. could easily appear in your call center, however, if managers decide to replace bulky, corded units with these ultracompact ear-mounted transmitter/receivers. GN Netcom's $299 DuoLink headsets could also appear in the offices of mobile sales professionals, since these units can pick up calls from a cell phone or land line while the user's in the office.

"Wireless is penetrating the office in many different ways," one vendor stated emphatically, and Motorola underscored that by showing a Pocket PC in its MPx line that will support Wi-Fi and cellular as well as Bluetooth connectivity.

With Bluetooth and 802.11b sharing the same frequency spectrum, is this a perfect storm of overlapping radio technologies? Not at all, says Bluetooth SIG Executive Director Mike McCamon. Version 1.2 of the specification, approved last fall, addresses that issue, he says. But most products available don't support it yet.

Bluetooth has made headway on PDAs: HP's iPaq models all support it, as does the Palm. The most common uses are for establishing a dial-up networking connection wirelessly through a Bluetooth-enabled cell phone and for synchronizing calendar and address-book data with desktops or laptops. But getting different device types to work together properly remains a problem in some cases and could be a support headache if IT has to get involved.

The SIG tests devices for low-level compliance with the specification, but compatibility issues remain — particularly at the application layer. Currently, no third-party certification or compatibility testing exists, so each manufacturer must do its own. Just outside the event, Rick Holden, a technical specialist at automaker Lexus, was demonstrating Bluetooth hands-free features in a top-of-the-line LS 430. During the demo — which, regrettably, didn't involve a test drive — he repeatedly emphasized that users should check the compatibility list at the Lexus Web site before buying a phone. Some phones, he says, don't pair up to the vehicle's navigation system in a "user-friendly way."

Even experts can have trouble. Ken Dulaney, a Gartner Inc. analyst who works with many wireless devices, says he spent more than a half hour recently in an unsuccessful attempt to synchronize data between a Nokia 6600 phone and IBM ThinkPad T40 notebook.

Then there's security. Recent reports of successful hacks into some brands of Bluetooth-enabled cell phones have raised concerns [QuickLink 46757], but McCamon maintains that Bluetooth is very secure, even if a few vendors' implementations aren't. He adds that vendors must balance security against ease-of-use concerns. Those focused on consumers are more concerned about ease of use and may not take full advantage of the Bluetooth specification's security options, such as its encryption and authentication features.

Products designed for business users are a bit better. For example, HP ships its PDAs with the autodiscovery feature turned off by default so others can't see the device. In addition, the devices can be configured so the user can pair with only specific devices and require that a personal identification number be entered before access is granted.

Given all this, one could make the case that it's better to bring Bluetooth into the enterprise in a controlled way by providing appropriate devices to users, rather than wait for users to bring in products that are bound to cause problems.

Regardless, it's clear that personal-area networks are already gaining a toehold in many companies. Now is a good time to start thinking about how to manage them. **46769**

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8:15am to 8:45am	**Off to See the Data Wizard: Reporting from the Yellow Brick Road** Maryfran Johnson, Editor in Chief, Computerworld
8:45am to 9:15am	**Leveraging Business Intelligence in HR: Current Best Practices and Coming Innovations** Sanjiv Anand, CTO, Hewitt Associates
9:15am to 9:45am	**Business Intelligence in Action at NASD** Martin Colburn, EVP and CTO, National Association of Securities Dealers
9:45am to 10:15am	Refreshment and Networking Break
10:15am to 10:45am	**Evolving the Enterprise: Leveraging Information for Competitive Gain** Jim Davis, SVP, SAS
10:45am to 11:15am	**Industry Analyst Perspective:** **The IT Bottom Line: Proving the Value Delivered** Rebecca Wettemann, VP, Research, Nucleus Research
11:15am to noon	**Panel Discussion:** **Creating the Transparent Organization: New Roles for Business Intelligence with Corporate Customers, Suppliers and Government Regulators** Moderator: Julia King, National Correspondent, Computerworld Panelists: Dennis Callahan, EVP & CIO, The Guardian Life Insurance Company of America; Dave Denton, VP of Financial Planning, CVS, Inc.; Robert Dutile, EVP, Key Technology Services, KeyCorp; Ron Miller, Senior Manager, Intel Corporation
Noon	Program Concludes

Chicago • June 9, 2004

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8:45am to 9:15am	**Leveraging Business Intelligence in HR: Current Best Practices and Coming Innovations** Sanjiv Anand, CTO, Hewitt Associates
9:15am to 9:45am	**Business Intelligence in Action at NASD** Martin Colburn, EVP and CTO, National Association of Securities Dealers
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10:45am to 11:15am	**Industry Analyst Perspective:** **The IT Bottom Line: Proving the Value Delivered** Ian Campbell, CEO, Nucleus Research
11:15am to noon	**Panel Discussion:** **Creating the Transparent Organization: New Roles for Business Intelligence with Corporate Customers, Suppliers and Government Regulators** Moderator: Julia King, National Correspondent, Computerworld Panelists: Bill Farrow, CIO and EVP, Chicago Board of Trade; Richard Gius, SVP of IT, Medical Products and Services, Cardinal Health; Scott Hicar, CIO and VP, Worldwide Information Technology, Maxtor Corporation; Shelley McIntyre, VP of Business Technology Services, The Guardian Life Insurance Company of America
Noon	Program Concludes

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Martin Colburn
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Jim Davis
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William Farrow
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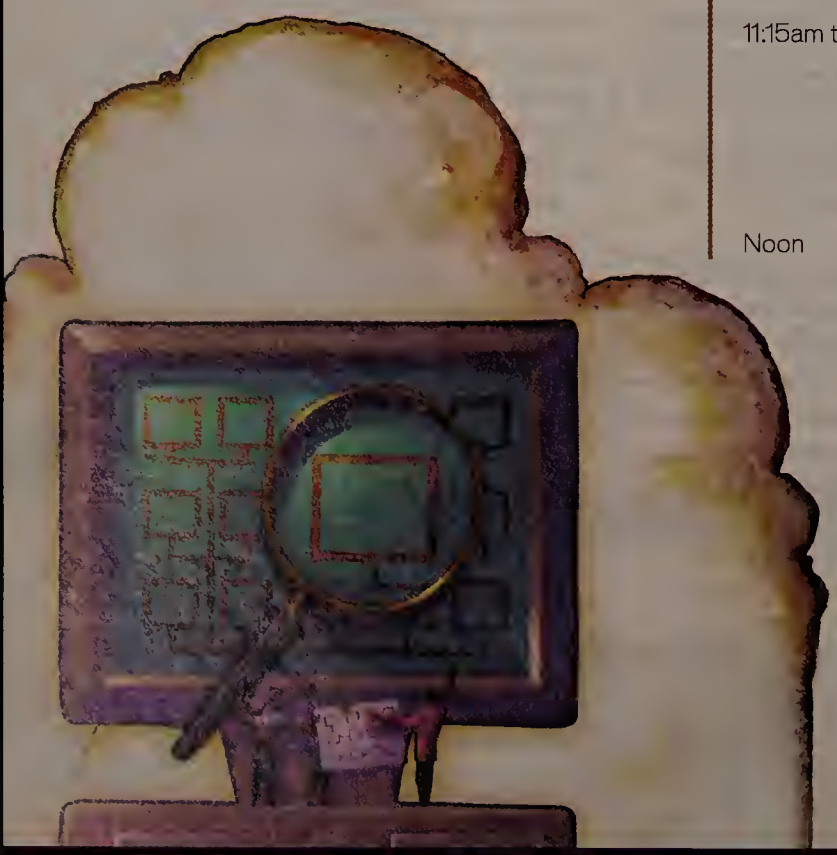

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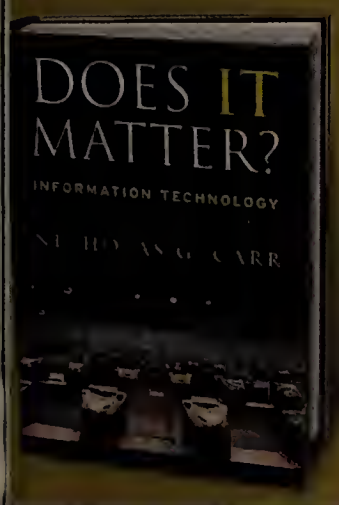

BOOK EXCERPT

ONE POWERFUL WAY to reduce costs without forgoing new systems is simply to spend more slowly. The rapid, ongoing fall in IT prices means that even small delays in purchases can dramatically reduce the cost of achieving a given level of IT functionality. And delaying IT investments can have other beneficial effects as well. Companies that stay off the leading edge reduce their chance of being saddled with buggy or soon-to-be-obsolete technology. They are also able to learn from the successes and mistakes of early movers, enabling them not only to avoid unnecessary costs but, often, to build better systems as well.

As late as February 2001, Cisco CEO John Chambers was telling an audience of corporate IT managers that executives "need to think about technology changes as waves. The leaders will always be one or two waves ahead in applications or services and the laggards one or two waves behind." At the same event, a senior partner at the consultancy PricewaterhouseCoopers was even more emphatic, telling companies that "the game is changing and they need to make abrupt and accurate changes or they will lose; and they will lose big. . . . [T]here is no fast-follower strategy."

Such rhetoric made for good marketing, but it was largely hollow. Except in rare cases, both the hope of achieving a defensible advantage through IT spending and the fear of obsolescence from failing to invest turned out to be unwarranted. It has become increasingly clear that many of the smartest users of technology stay well back from the cutting edge, waiting to make their purchases until standards and best practices solidify and prices fall. They let their more impatient competitors shoulder the high costs of experimen-

JORDIN ISIP

FOLLOW, Don't Lead

A year after his controversial Harvard Business Review article raised hackles in the IT world, the author maintains that the cutting edge is the last place a CIO should be. **BY NICHOLAS G. CARR**

Q&A Reflections on Turbulent Times

The publication this week of the book **Does IT Matter?** *caps a year in which Nicholas G. Carr has become the poster boy for IT cost cutting and the villain IT partisans love to hate. He talked with Kathleen Melymuka about what it all means.*

So much has happened since we first talked about your piece that appeared in *Harvard Business Review* last year [QuickLink 37990]. What has surprised you most about the response? The size of it. I certainly didn't expect that it would come to define the terms of debate in the IT field. I knew I was saying some controversial things, but I had no idea it would strike such a nerve. The second thing that surprises me is the incredible diversity of opinions that have been voiced about my ideas. It shows that companies and IT suppliers are coming at IT decisions from a wide range of perspectives. There's no one reigning philosophy about how to approach IT in business.

How do you respond to people who say that your argument is not only wrong but also dangerous in that it can cause companies to miss critical opportunities? I think managers are intelligent people, fully capable of thinking about diverse ideas and figuring out the best way to apply them to their own business. The real danger is in trying to silence the debate. Even the parts of the debate that have been critical of my article seem to me to be altogether healthy and, in the end, constructive.

Which parts of your argument do you find resonate most with IT folks? The idea that more and more of the hardware and software that companies buy has been commoditized and really doesn't provide much opportunity for competitive advantage or isn't particularly strategic. I think in the past few years, a lot of companies have embedded that view into the way they approach buying and managing IT resources. The debate seems to focus on whether there is some small slice that is not commoditized.

In your debates with IT leaders, have any of their counterarguments caused you to revise your own thinking? Some of the counterarguments have caused me to deepen my own thinking, and I try to express that in the book. For example, there were comments that commoditization applies to hardware but not to software. I don't think that's true. I think we are seeing the commoditization of business software in a broad manner. Another useful question was whether ongoing advances in IT architecture provide a basis for competitive advantage. It's true that we have seen a dramatic evolution in architecture, but I would argue that all the trends are away from proprietary and toward open, shared, standardized architecture, and that erases the ability for companies to gain advantage.

If you were an IT leader, what would you be doing today? If I were a CIO now, I would be thinking of how to capitalize on commoditization. Market power is shifting from vendors to buyers, and today CIOs have a whole new range of options and considerably greater leverage to drive down costs. I'd be managing IT aggressively, but not entertaining outsized hopes that it will transform my business. **46433**

tation, and then they sweep past them, spending less and getting more.

Look at the package delivery business. FedEx has received widespread, and well deserved, acclaim for its efforts at pioneering new IT applications, such as online package tracking. Less appreciated has been the more deliberate approach taken by its archrival, UPS [QuickLink 45962]. In fact, UPS was often attacked through the 1980s and 1990s for being a technological slowpoke. All the while, though, UPS was carefully following in FedEx's tracks, learning not just how to copy its rival's systems but often how to make them better and cheaper. When UPS rolled out its own logistics management software, for instance, it went with a more open system than FedEx's, making it easier for customers to incorporate UPS's technology into their existing systems.

Far from hampering UPS, the slow, copycat approach paid off. By the late 1990s, some big shippers had begun to shift their logistics contracts from FedEx to UPS. National Semiconductor, for one, abandoned a Singapore warehouse constructed by FedEx in favor of a new, more flexible one operated by UPS. Today, ironically, UPS handles far more shipments from Internet retailers than its more technologically aggressive rival, and it remains more profitable as well. When it comes to IT, the tortoise often beats the hare.

Some managers may fear that being stingy with IT dollars will damage their competitive positions. But they need not worry. Studies of corporate IT spending consistently show that greater expenditures rarely translate into superior financial results. In fact, the opposite is as likely to be true. In 2002, the consulting firm Alinean compared the IT expenditures and financial results of 7,500 large U.S. companies and found that the top performers tended to be among the most tightfisted spenders. The 25 companies that delivered the highest economic returns, for example, spent on average just 0.8% of their revenues on IT, while the 25 worst performers spent 2.7%.

One of the largest studies of the impact of information technology on business performance was carried out by the McKinsey Global Institute, the internal think tank of the management consultancy McKinsey & Co. In a three-year study, the institute examined IT spending and business productivity at the industry and firm levels in the United States, Germany and France. It, too, found "no correlation" between IT investment and performance. The real driver of business productivity improvements during the 1990s, the study discovered, was competition, which pushed managers to take aggressive measures to improve their companies' efficiency and effectiveness. In those industries with the strongest competitive pressures, IT investments produced positive returns. But where competition was more restrained, even the most aggressive IT spending had little benefit.

> **When it comes to IT, the tortoise often beats the hare.**
>
> **– NICHOLAS G. CARR –**

Many firms have become accustomed to double-digit increases in their annual IT budgets. They consider it a victory if they're able just to cut the rate of increase in spending. But a very different approach may now be in order. As the opportunities for IT-based advantage continue to diminish, the penalties for overspending will only grow. Following the lead of GM, Verizon and the other companies that have actually reduced their year-over-year IT spending, more businesses may want to establish explicit goals for trimming their IT budgets — by 5% a year, say. That won't be the right target for every company, of course. Some may find it makes good business sense to invest more heavily in IT in the short run — in order, for example, to replace outdated systems with new ones that offer more efficiency and flexibility — and others may need to increase their spending simply to maintain their competitiveness. But why not start with the assumption that IT spending should now go down every year, not up, and then make exceptions as the business requires? **46432**

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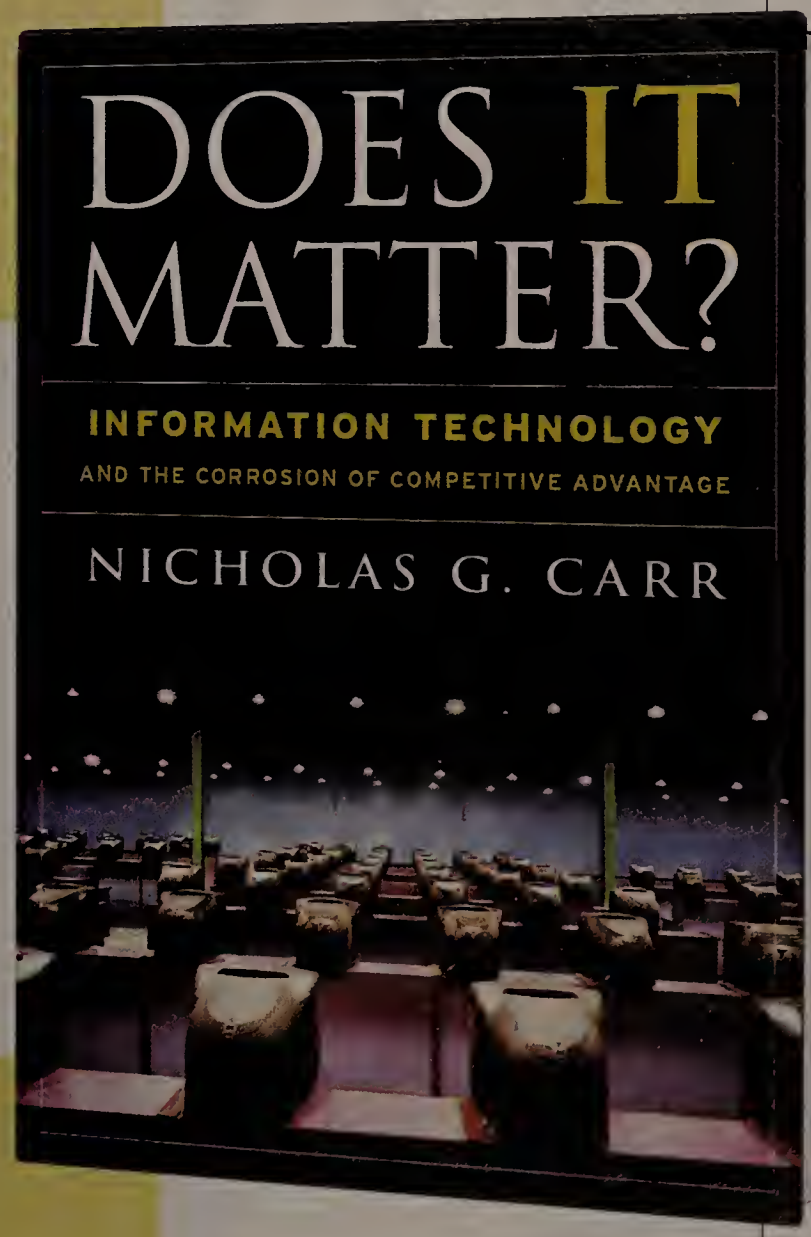

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BARBARA GOMOLSKI

Don't Be Naive About Outsourcing

OUTSOURCING IT functions is extremely popular these days, but many companies are still approaching outsourcing decisions with a good deal of naiveté. If your organization is thinking about outsourcing all or part of IT, here are five rules to help you avoid common pitfalls.

1. Know your strengths. If your organization runs a world-class data center, don't be surprised if you're unhappy with the outsourcer after turning it over. Companies will see the most dramatic cost and service-level improvements after outsourcing functions that aren't among their core competencies. It's best to outsource the things your IT organization isn't currently good at.

BARBARA GOMOLSKI, a former *Computerworld* reporter, is a vice president at Gartner Inc., where she focuses on IT financial management. Contact her at barbgomolski@yahoo.com.

If you lack the information needed to determine what your IT organization *is* good at, step back and figure that out before identifying areas for outsourcing. Determine how your IT organization compares to the outside market by doing workload benchmarks and cost comparisons. You may be surprised to learn that your staff is as good as, or better than, the outside competition.

2. Don't completely write off IT infrastructure. I hear a lot of IT managers saying they'll outsource infrastructure because "it's not strategic." These kinds of statements make me nervous. For the record, *infrastructure*, as used here, refers to the nuts and bolts of an organization's information systems, including data center operations, networks, desktops and help desks.

While parts of IT infrastructure are often good candidates for outsourcing, companies have a tendency to go overboard when identifying the components of so-called noncore IT functions. Let's say a company decides to outsource its data center because it can save money and increase service levels by doing so. That's great. However, best-in-class companies don't outsource 100% of the staff involved in the activities being outsourced. They retain individuals who "own" the key processes involved in the functions being outsourced.

By retaining key individuals, the company is more likely to see continual improvements and overall success. In the example above, a company that outsources data center operations might retain a business continuity and disaster recovery process owner because it feels that function is critical.

The lesson here is to make sure you don't inadvertently discard processes that are essential to the success of IT when looking for areas of the infrastructure to outsource.

3. Know what you are outsourcing. Many companies struggle when identifying exactly which IT services they wish to outsource. Often, this is because they lack good definitions and boundaries around the IT services they deliver. Companies that have clear definitions of the IT services they provide (and clear definitions of the components of those services) find it easier to identify areas that may be candidates for outsourcing.

4. During vendor selection, don't shop based on price alone. Cost savings are often a motivator for outsourcing, and price is definitely important. However, price shouldn't be the only driver of the vendor-selection decision. I meet a lot of IT leaders who proudly describe how they outnegotiated an outsourcing vendor and got the best deal available. The reality is that vendors are in business to make money. (The typical profit margin on IT outsourcing is around 30%, by the way.) So a company may push a vendor to the wall on price, but in the end, that vendor will find a way to make money on the account. It's better to negotiate a contract that's fair to both parties at the outset than it is to get a "great deal" that ends up costing more money than expected because of changes in scope.

5. Stay engaged with the work and the vendor after outsourcing. Some IT managers are under the impression that outsourcing an IT function absolves them of responsibility for the quality of that service. Untrue. To ensure that the vendor delivers and to manage the ongoing relationship, companies need to devote staff to the management of outsourced services. Failure to do so guarantees disappointment with the outsourcing deal. Whether they call them contract managers, relationship managers or vendor managers, companies need representatives of their organization to manage the outsourced relationship. **46508**

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Wireless LANs Find Their Voice
Developments in wireless VoIP technology have pushed wireless devices from bleeding edge to mainstream. St. Agnes HealthCare's CIO, William Greskovich (left), equipped hospital staff with VoIP communicators and realized dramatic improvements in productivity. Page 40

Tales From the Road
Global road warriors need to outfit themselves with a plethora of gadgets to ensure wireless connectivity anytime, anywhere. Page 44

OPINION
Still Worried About Wireless
Encryption is better. Installation is a snap. User acceptance is high. Wireless problems have come and gone, right? Columnist Mark Hall doesn't think so. Page 47

EDITOR'S NOTE

WIRELESS TECHNOLOGY — with its incompatibilities, security holes, dead zones and fuzzy ROI — has got to be the most immature and frustrating field for IT managers. But it's also the most exciting. Almost every day, there's a new capability, fancier gadget or higher speed — and technologists eat that stuff up.

In this special report, for example, we cover the new capability to do IP telephony over wireless LANs with gadgets that act like *Star Trek* communicators. What could be cooler? And carriers are rolling out nationwide, high-speed cellular networks that, eventually, will be a boon to road warriors and mobile data applications.

But as corporate IT folks, you don't get paid to install or support cool toys; you get paid to enhance productivity and the bottom line. (You knew that, right?) That requires some less-than-cool discipline along the following lines:

- Provide the simplest technology that will get the job done.
- Match the technology to the type of work the individual does. Some employees are message-oriented, for example, while others need to fill out forms in the field.
- Avoid chaos by managing costs and devices centrally and establishing company policies. Cell phone bills are already out of control, and the next challenge will be keeping costs for Wi-Fi hot-spot connections in line.

That's what IT *management* is all about: selecting technologies that provide business benefits while controlling the costs. If you're lucky, and the ROI is good, maybe you can still get your hands on a *Star Trek* communicator. **46635**

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Mitch Betts is Computerworld*'s Features editor. Contact him at mitch_betts@computerworld.com.*

JOEL NAKAMURA

THE Untethered Worker

SPECIAL REPORT

Roaming employees can use wireless LANs for voice calls and high-speed cellular networks for data.

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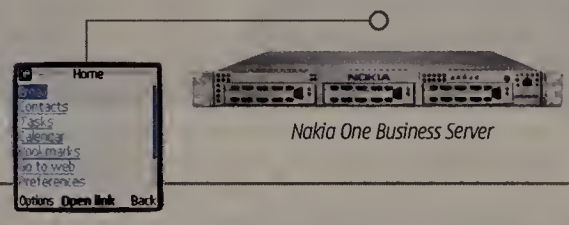

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WILL GRESKOVICH says St. Agnes HealthCare has realized dramatic improvements in productivity, thanks to a Vocera WLAN VoIP system.

CHRIS HARTLOVE

WIRELESS LANs Find Their Voice

Voice-over-IP technology operating over wireless LANs has redefined voice communications, offering greater mobility and dramatic savings. By Bob Brewin

THE COMBINATION of wireless LANs and IP-based telephony has forever changed the definition of mobile phones and how they're used in the enterprise.

Today, a wireless voice-over-IP (VoIP) phone operating over a WLAN can look much like a typical cordless phone. And thanks to accelerated hardware and software development, these phones are morphing into wireless IP headsets and *Star Trek*-like voice-activated communicators and software phones, also known as softphones, that are just another program on a laptop or handheld computer.

This hardware and software was designed to piggyback on proliferating enterprise WLANs, including new voice-grade WLAN software, access points and switches from a growing number of manufacturers.

These developments have transformed WLAN VoIP from a bleeding-edge technology in 2001 to a technology close to maturity today, says Shawn Wilde, director of worldwide operations at Trimble Navigation Ltd., a Sunnyvale, Calif.-based manufacturer of Global Positioning System receivers. Trimble began using wireless IP phones globally last year.

As WLAN VoIP technology has matured, the number of vendors that offer mobile VoIP phones and the WLAN infrastructure designed to support them has increased. Cisco Systems Inc. last year introduced its first VoIP handset and additions to its Internetworking Operating System designed to support WLAN IP voice systems.

In early March, Alcatel in Paris and Nortel Networks Ltd. in Brampton, Ontario, entered the market. Both companies will base handsets on technology developed by industry pioneer SpectraLink Corp. in Boulder, Colo. Both will resell WLAN switches and access points from San Jose-based Airespace Inc.

Market Heats Up

Airespace is one of a handful of start-ups that, along with established companies such as Cisco, Symbol Technologies Inc. and Proxim Corp., are vying to provide the quality of service and roaming infrastructure needed to support VoIP in the enterprise WLAN environment.

Chris Kozup, an analyst at Meta Group Inc., cautions that supporting VoIP calls over a WLAN presents a far bigger challenge than providing wireless data services, especially when users roam and their calls need to be handed off from one subnetwork to another. This requires the handset or softphone to obtain a new dynamic IP address, which must happen in 100 milliseconds or less, or the call is dropped.

Some companies, such as Cisco, have developed proprietary fast-roaming protocols, but Ritch Watson, director of VoIP at Holtsville, N.Y.-based Symbol, says the first industrywide meeting to discuss roaming standards was just held in March.

Despite this challenge, early enterprise adopters of WLAN VoIP say the technology delivers bottom-line savings and increases mobility in ways they couldn't have imagined.

St. Agnes HealthCare, a 299-bed hospital in Baltimore, deployed WLAN VoIP communicators from Vocera Communications Inc. in Cupertino, Calif., in lieu of installing a new paging or nurse-call system. The hospital equipped nurses, nurse technicians and care-unit secretaries with Vocera hardware last year and realized dramatic improvements in productivity, says William Greskovich, St. Agnes' CIO and vice president of operations.

The Vocera system consists of 2-oz. voice-activated VoIP communications badges (see photo at right). Voice traffic is directed by the system software, which runs on an Intel-based server at St. Agnes. The badges can be clipped to a shirt pocket or collar to provide a hands-free communications system, Greskovich says.

Nurses and other employees log in via a voice-recognition system with their badges and can call other employees by saying their names. The system also tracks users based on their proximity to 120 Cisco access points in the hospital, Greskovich says. To locate one another, nurses speak a simple voice command to find "Nurse X." The system responds, "Nurse X is on the fifth floor," and another command connects the nurses.

The hospital's phone directory is loaded into Vocera's software, making a hands-free call quick and easy, Greskovich says. To call the blood bank or pharmacy, nurses say the department's name and are connected. Staffers can make outside calls by saying the number, and they are then connected through a Vocera interface to the hospital's private branch exchange (PBX), he says.

St. Agnes commissioned First Consulting Group Inc. in Long Beach, Calif., in December to assess the Vocera system's effect on workflow and nurses' satisfaction. The study found that the system saves unit secretaries 1,446 hours, nurses 1,146 hours and nurse technicians 626 hours each year.

That works out to about 1.7 full-time equivalents per unit, or a savings of $74,000 per unit each year, Greskovich says. The system cost about $200,000 for the server software and $300 per badge for each of the 350 badges.

Greskovich says the Vocera system

SEEING VOICES

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VOCERA's voice-activated communicators

has also reduced intercom voice pages, which can be annoying to patients and staff alike. He said he believes that the Vocera system will help St. Agnes cut more hours and improve workflow this year as staffers such as maintenance personnel and security guards are added to the system.

Always On, Anywhere

Trimble Navigation has deployed a more conventional IP system: 40 of Cisco's 7920 wireless IP phones plus 20 Cisco softphones, all of which work over the company's global Internet-based virtual private network. Wilde says Trimble initially deployed the devices to IT staffers who aren't tethered to their desks.

The IP phones provide easy global connectivity, he adds. When Wilde travels to Trimble's research and development facility in New Zealand, for example, he takes his 7920 with him. When Wilde turns on the phone in New Zealand, it connects through a WLAN to Trimble's global network with the same number he uses in Sunnyvale.

The same thing happens when Wilde uses his 7920 in the company's plant in Germany, making it easier for anyone at Trimble to track him down using his standard office phone number, rather than trying to determine which country he's in and then dialing a long international phone number.

When Wilde makes an outgoing call from New Zealand, the device places the call through the PBX in Sunnyvale. Using the 7920 overseas "has definitely chipped away at my cell phone bill," he says.

Besides giving the 7920s to the IT staff and department managers, Trimble has also deployed them to workers in shipping facilities who aren't near a desk phone. The device gives these workers the connectivity and functionality of a desk phone while allowing them to be mobile, Wilde says.

Wilde adds that he wants to deploy IP phones to office and plant staff but plans to wait until he can assess the price versus performance and capabilities of combined cellular and IP phones. Such models are expected from both Motorola Inc. and Nokia Corp. later this year (see box at right).

Student Body in Motion

Dartmouth College in Hanover N.H., plans to use its WLAN infrastructure to fulfill all of its students' and staffers' voice, data and video needs, according to Brad Noblet, the college's director of technical services.

Dartmouth has already deployed a wide range of VoIP clients, including 80 Cisco 7920 phones, 1,000 Cisco softphones and 100 Vocera badges. Noblet says Dartmouth also has a contract with TeleSym Inc. in Bellevue, Wash., for 600 of its SymPhone clients.

These clients operate over 500 Cisco access points, including some installed specifically to serve maintenance staff, such as in the extensive network of steam tunnels throughout the campus.

Noblet says he decided to build Dartmouth's network infrastructure around WLANs rather than wired networks because a college campus is "one of the most mobile environments," with students in constant motion between dorms, classrooms, dining halls and the library.

Noblet has bold plans to beef up the campus WLAN infrastructure to support all 4,000 students with their own softphones integrated into laptops or handheld computers. Currently, faculty, administrators and support staffers are the primary users of the VoIP hardware, he adds.

Noblet says he plans to boost bandwidth and coverage over the next 18 months, with 1,500 access points supported by the Cisco infrastructure as well as new wireless switches and low-cost access points from Aruba Wireless Networks Inc. in San Jose. When it's complete, the campus WLAN will support the majority of voice, data and video services and be one of the first and largest converged networks of its kind in the U.S., he says.

This grand vision may take longer to achieve in traditional office-based environments, according to vendors and analysts. Bill Rossi, vice president of Cisco's wireless networking business unit, says demand for WLANs and wireless VoIP still remains low in what he calls the "carpeted office."

Kozup agrees, saying that in the near future, WLAN VoIP will follow the path blazed by data WLAN installations. Users in health care, higher education and retail will be the most likely early adopters, he says. **45822**

A Guide to VoIP Hardware

A YEAR AGO, IT managers would have had few choices when purchasing Wi-Fi VoIP infrastructure or phone hardware. But since the start of this year, major telecommunications manufacturers have jumped into the Wi-Fi VoIP field, vying for market share with a handful of start-ups that have developed products to meet the technical challenges of placing a voice phone call over a WLAN.

In fact, three of the biggest names in telecommunications hardware have based their Wi-Fi VoIP products on WLAN switches from Airespace. Alcatel, Nortel and the NEC America Inc. division of NEC Corp. all plan to resell versions of Airespace's WLAN switches, which promise handoffs between access points with latency of 30 seconds or less.

Start-up Meru Networks Inc. in Santa Clara, Calif., has taken a similar switch-based approach with equally speedy results, while industry veteran Proxim has tweaked its latest family of access points to handle voice handoffs with shorter latency than earlier products.

All these companies are vying with Cisco, which dominates the enterprise WLAN market. Earlier this month, it added enhanced WLAN management to its Catalyst 6500 series wired network switches. Cisco said this will allow enterprises to control integrated wired and wireless networks from a single device, called a Wireless LAN Service Module. The WLSM manages wired and wireless firewalls, intrusion detection and content filtering. SpectraLink has agreements with Alcatel and Nortel to resell its phones, and last year Cisco jumped into the market with its own Wi-Fi handset.

Chris Kozup, an analyst at Meta Group, says the handoff requirements of voice phone calls require a far more robust WLAN architecture than a data network does. He says network managers must choose and deploy their infrastructure hardware with more care than data-only networks, which have more tolerance for slow handoffs. That said, enterprises have a variety of choices for both infrastructure and phones, including wireless softphone clients.

– Bob Brewin

INFRASTRUCTURE HARDWARE

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Airespace 4000 WLAN Switch, $11,000
Airespace 1200 AP, $400
Airespace Control System Software, $4,000
Rebranded and sold by Alcatel, NEC America and Nortel
(866) 546-2100 / (408) 635-2000
www.airespace.com

CISCO SYSTEMS INC.

Wireless LAN Services Module, $18,000
Cisco Aironet 1100 Access Point, $599
Cisco Aironet 1200 Access Point, $899
(800) 553-6387
www.cisco.com

MERU NETWORKS INC.

Packages consist of the following:
Meru System Controller (switch), $7,995
Meru Access Points, $695
Meru System Director (software), no charge; bundled with controller and access points
(408) 215-5300
www.merunetworks.com

PROXIM CORP.

Orinoco AP-4000, sold through resellers for $580 to $650
(800) 229-1630 / (408) 731-3675
www.proxim.com

PHONES

CISCO SYSTEMS

Cisco 7920 Wireless IP Phone, $595

SPECTRALINK CORP.

NetLink e340, sold through resellers for $370 to $470
NetLink i640, sold through resellers for $490 to $600
(800) 676-5465 / (303) 440-5330
www.spectralink.com

ZYXEL COMMUNICATIONS CORP.

Prestige 2000W, sold through resellers for $259 to $299
www.zyxel.com

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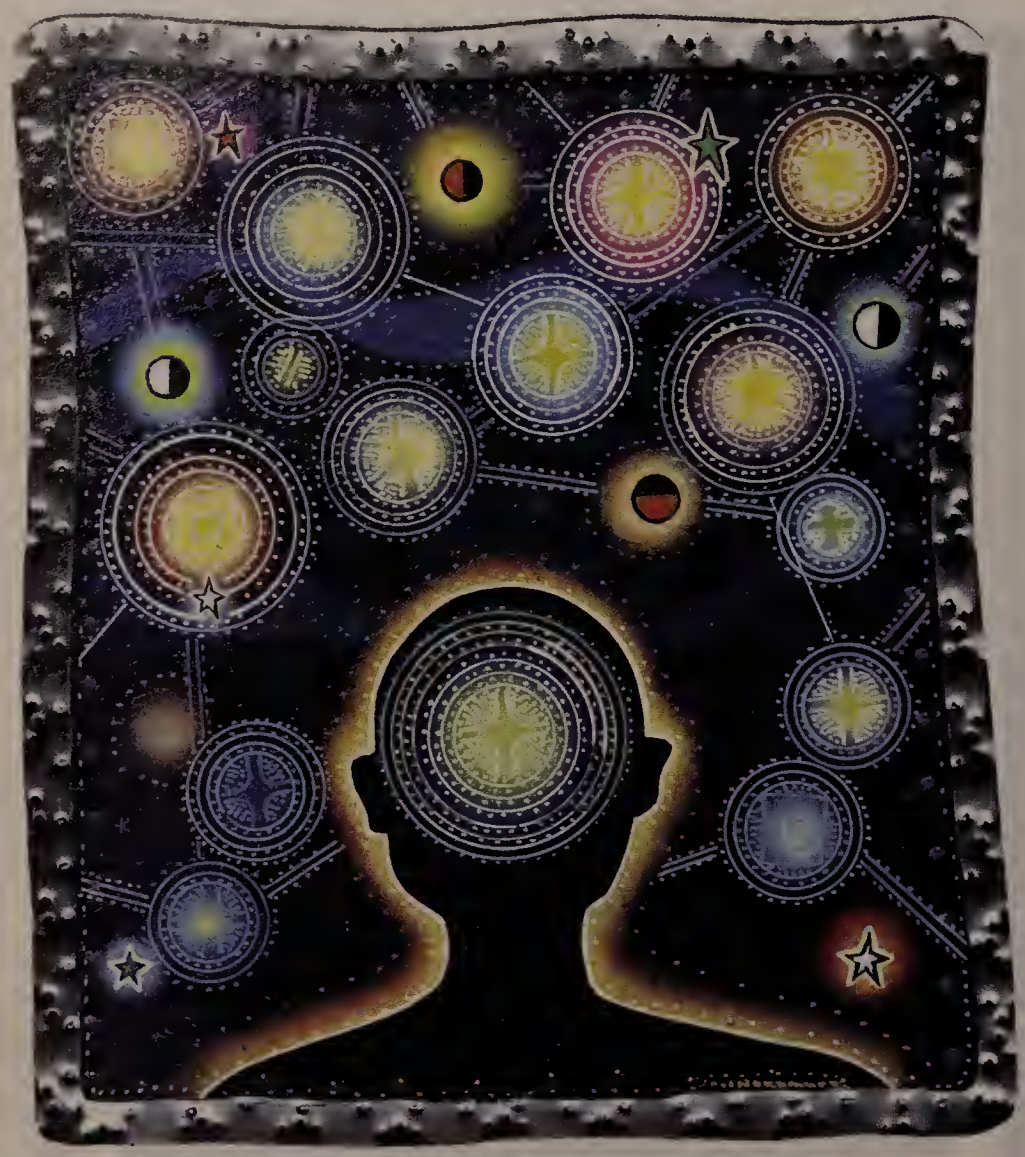

JOEL NAKAMURA

Which Wireless Service?

The choice isn't always clear, as mobile data services struggle to balance coverage and speed.

By Joanie Wexler

IF YOU'RE INVESTIGATING nationwide cellular plans for your company, there's one thing that will quickly become clear: Not all cellular services are created equal.

The six largest U.S. wireless licenseholders run mobile networks that are in near-constant transition. Figuring out which services will best suit your users in terms of speed, coverage and service quality can be difficult.

The good news is that you can usually purchase a data service with a dual-mode device that also lets users make phone calls. Still, you must look at each carrier's coverage map, determine which colors correspond to which services and decide which service best matches each user group.

Awaiting Availability

If your users remain in a relatively confined region, it's simpler to determine if there are services for them.

For example, the city of Pueblo in south central Colorado had no wireless data options until AT&T Wireless Services Inc.'s Enhanced Data Rates for Global Evolution offering recently came to town. EDGE speeds average 100K to 130Kbit/sec.

Now, police officers are able to file reports from their patrol cars immediately after incidents occur, according to John Wilkinson, the city's IT director. "This is much more efficient than having officers wait to do this work at headquarters at the end of their shifts," he says.

AT&T's EDGE service, which is known for having holes, covers about 75% of the U.S. population. However, it suits the 44-square-mile area of Pueblo just fine. The service also enables officers to run checks against the Colorado Crime Information Center and National Crime Information Center databases. This prevents them from having to call into a dispatch center and wait in a queue behind emergency 911 calls.

"We think officers will perform more checks if they can do it themselves," says Wilkinson.

An IT manager might do well to group users by degree of mobility and which applications they use and then match appropriate services to each group.

"For example, knowledge workers often sit at Starbucks or at the airport with a laptop. In these places, Wi-Fi hot-spot services suffice," says Dave Passmore, an analyst at Burton Group in Midvale, Utah.

Wi-Fi hot spots use IEEE 802.11 LAN, not cellular, technology. They offer multimegabit speeds in public places where traveling workers are likely to linger. The trade-off is that the coverage is limited to that local venue and isn't oriented to broad roaming.

So Wi-Fi hot-spot services don't cut it for field service and transportation personnel, public safety officials and some salespeople. "These folks have a real need for a widespread broadband mobile service," Passmore says.

Case in point: Re/Max International Inc., a global real estate firm based in Greenwood Village, Colo., began offering AT&T Wireless' EDGE service to its agents in January.

"The Multiple Listing Service has pictures [of properties for sale]. Viewing them on a notebook computer when out with a client is a tremendous marketing tool," says Bruce Benham, Re/Max's senior vice president and chief technology officer.

He says agents can upload six to 10 pictures and run an attached video that offers a virtual tour of the property.

"Our associates aren't sitting in Starbucks — they are taking clients around. And they don't want to have to ask for an analog dial-up line at someone's house," Benham notes.

He says Re/Max tested both EDGE and AT&T's General Packet Radio Service, a technology that preceded EDGE. GPRS averages about 20K to 40Kbit/sec. but spans a wider footprint. "GPRS was clumsy for this application. You need at least 100Kbit/sec. to look at pictures," Benham says.

Mixing It Up

Higher speeds and greater coverage would make wireless service more valuable to Washington-based National Public Radio Inc.

Reporters at the nonprofit producer and distributor of radio programming transmit sound clips and file audio stories from the road using Verizon Wireless' 1x Evolution-Data Only (EV-DO) service where it's available (see chart). But 1xEV-DO, which offers speeds of 300K to 500Kbit/sec., is available only in Washington and San Diego. In the rest of the country, the fallback service

MORE COVERAGE ONLINE

TERMINOLOGY: What's the difference between 2G, 2.5G and 3G networks? Learn in this online glossary. **QuickLink 46025**

RATE PLANS: The industry profits from your mistakes. Get expert assistance for managing your voice/data rate plans. **QuickLink 34471**

COVERAGE AREAS: Find out where high-speed cellular services from Verizon Wireless, Nextel and AT&T Wireless are offered. **QuickLink 46028**

Today's High-Speed Mobile Data Service Options

CARRIER	FASTEST SERVICE OFFERED/AVERAGE ACTUAL SPEED*	COVERAGE REACH	WI-FI SERVICE?/ NUMBER OF HOT SPOTS**
AT&T Wireless	EDGE/ 100K to 130Kbit/sec.	6,500 U.S. cities and towns, 220 million people	Yes/800
Cingular Wireless	EDGE/ 100K to 130Kbit/sec.	13 states	No
Nextel	Flarion FLASH-OFDM/ 1Mbit/sec.	Raleigh-Durham and Chapel Hill, N.C.	No
Sprint PCS	1xRTT/ 50K to 70Kbit/sec.	240 million people	Yes/2,000
T-Mobile	GPRS/ 20K to 40Kbit/sec.	More than 9,000 U.S. cities and towns; 224 million people	Yes/4,200
Verizon Wireless	1xEV-DO/ 300K to 500Kbit/sec.	Greater Washington area and San Diego	Yes/nearly 1,000

*Most services listed will "fall back" to slower but farther-reaching services when users are out of coverage range.

**Some hot-spot availability is through roaming/resale agreements with wireless ISPs and aggregators, such as Airpath Wireless Inc., Boingo Wireless Inc., StayOnline Inc., STSN Inc. and Wayport Inc.

SOURCE: INFORMATION SUPPLIED BY THE CARRIERS

is Verizon's 1xRTT network, with speeds of 40K to 60Kbit/sec.

Jane Holmes, manager of remote mobile services at NPR, makes this plea to Verizon: "Roll out more cities!"

Because of the fragmented nature of coverage and speed, NPR uses several networking technologies. For example, an NPR reporter aboard the campaign bus of Sen. John Kerry, the Democratic presidential hopeful, came equipped with both a satellite phone and a Verizon 1xRTT data card.

"The satellite phone weighs 35 pounds. You have to set it up and make sure no one is in the way," Holmes says. "The reporter just used the 1xRTT Verizon card and never touched the satellite gear."

However, Holmes says, "even 1xRTT isn't available everywhere we want to go."

At the time of this writing, for instance, NPR was hoping to transmit music from the Gilmore Piano Festival, a two-week musical event in western Michigan. "But Verizon's 1xRTT map is kind of bare there," Holmes says. "So we'll have to see."

Where and How Fast?

Generally, coverage and speed are inversely proportional: The fastest services are available in the fewest places.

For example, primary markets tend to be overserved with multiple services, while many rural areas remain ignored. "All wireless providers in northern Nevada have poor digital cell service," says a telecommunications engineer who works for a natural gas pipeline company that he asked not be identified. "I can understand . . . there are many factors such as terrain obstacles and population density for providers to consider. But [Verizon's] 'Can you hear me now?' commercials really crack us up."

And carriers that have tried to accommodate the underserved haven't fared well: Kirkland, Wash.-based Monet Mobile Networks Inc., which covered eight cities in Wisconsin, Minnesota and North and South Dakota with the nation's first commercial 1xEV-DO service, closed last month.

Verizon Wireless has committed to spending another $1 billion through 2005 to expand the coverage area of its 1xEV-DO service, dubbed BroadbandAccess. That investment is on top of its regular $4 billion annual network capital spending. The carrier hasn't announced which cities will get the service, but the size of the dollar figure bodes well for respectable coverage.

Still-higher-speed services are emerging, too. T1-like mobile speeds (1.5Mbit/sec., burstable to 3Mbit/sec.) are available in Raleigh-Durham and Chapel Hill, N.C., from Nextel Communications Inc. in Reston, Va.

However, the rest of the carrier's nationwide Motorola iDen-based network runs at 15K to 20Kbit/sec. While Nextel isn't yet committing to rolling out the megabit-speed technology nationwide, it does plan to deploy the next generation of iDen during the second half of this year.

The Nextel "WiDen" network will quadruple speeds to 60K to 80Kbit/sec. and cover 293 of the top 300 U.S. markets, says a Nextel spokesman.

And AT&T plans to deploy Universal Mobile Telephone System technology in four markets serving 350,000 people by year's end. UMTS will be the first true-to-standard 3G, or third generation, service, running at about 2Mbit/sec. for stationary users.

At What Cost?

Interestingly, most cellular data services are priced the same: about $80 monthly for unlimited usage, regardless of speed. Roaming charges of about $10 per megabyte apply when crossing carrier network boundaries.

"This needs to drop dramatically to achieve massive adoption," says Herschel Shosteck, president and chairman of The Shosteck Group, a wireless analysis firm in Wheaton, Md.

In the meantime, purchasers should weigh service cost against the value of the mobile application, advises Clint Wheelock, director of wireless research at In-Stat/MDR, a Scottsdale, Ariz.-based market research firm.

"Enterprises might limit the scope of individuals allowed to get [unlimited] service," he says. "But for users with certain applications, data speeds [at 100Kbit/sec. and up] can really enhance productivity and are well worth the $80."

In-Stat/MDR recently completed a survey of about 1,200 mobile business users who ranked their carrier satisfaction levels. Verizon Wireless took top honors, with a 75% positive rating, followed by Nextel with 63% and T-Mobile with 62%. AT&T Wireless (47%), Sprint PCS (53%) and Cingular Wireless (56%) scored below-average rankings. T-Mobile and AT&T wireless subscribers were most likely to defect and move to other suppliers.

In fact, Wheelock predicts that Cingular Wireless' pending $41 billion acquisition of AT&T Wireless won't be good news for the customer service portion of user satisfaction ratings. "Usually, mergers are disruptive to customer service," he says.

But Re/Max's Benham says he's hoping for better coverage and enhanced services as a result of the combination of resources. "Between the two companies, I expect to see significant, enhanced services over the next few years," he says. **46024**

Wexler is a freelance writer in California's Silicon Valley. Contact her at joanie@jwexler.com.

Alternatives To Cellular

Network services based on emerging IEEE 802.16e and 802.20 standards are joining 802.11 LANs to rival traditional cellular technologies for speed.

Multimegabit-speed 802.11b-based wireless LAN hot spots became the first cellular competitor in limited areas. Hot-spot deployment costs are a fraction of those for wide-area wireless data service, both because the equipment is cheaper and because they carry no licensing fees. So mobile network operators are "filling in" their cellular coverage with these services (see chart).

A recent Gartner Inc. report suggests that the number of hot-spot users worldwide will triple from 9.3 million in 2003 to 30 million in 2004.

Meanwhile, the IEEE 802.16e and 802.20 working groups are specifying new mobile air interfaces. Bedminster, N.J.-based Flarion Technologies Inc., which is heavily involved in 802.20 efforts, supplies the infrastructure of Nextel's 1M to 3Mbit/sec. mobile service, now available in Raleigh-Durham and Chapel Hill, N.C. Market trials of the Flarion network are currently under way in Washington, Europe and Korea, says Ronny Haraldsvik, Flarion's senior marketing director.

802.16e, slated for standards approval by late 2004, will add mobility to stations that primarily support fixed wireless networking in the 2-to-6-GHz band. 802.20 is specified for the 500-MHz-to-3.5-GHz range, aiming to bring full mobility to IP wireless networks to rival DSL and cable-modem Internet access services – even for users who are in vehicles that are traveling at speeds as high as 150 mph, says Haraldsvik. It's not yet clear when 802.20 standards will be final.

Pulling these efforts together, an IEEE working group in March began to standardize the way session handoffs take place between heterogeneous 802-based networks. The new 802.21 working group's goal is to enable client devices to automatically choose the best available network connection and seamlessly hand off sessions among networks during roaming without user involvement.

– Joanie Wexler

Tales From The Road

Loaded with gadgets and technical savvy, three corporate users share their strategies for staying connected in a sometimes fractured wireless world. By Bob Brewin

AT FIRST GLANCE, those road warriors who slow airport security lines while they fill up plastic bins with cell phones, PDAs, e-mail pagers and Wi-Fi-equipped laptops look like hopeless geeks who just can't resist the latest mobile toy.

But according to enterprise users whose work depends on wireless technology, it takes multiple devices operating on multiple networks to ensure a connection. That's true now and will be for the foreseeable future, they say.

That's because no U.S. cellular carrier provides truly nationwide coverage; one carrier usually provides better coverage in certain areas than the others do. And some U.S. cell phones and data cards don't work at all overseas because of incompatible standards, which means global workers have to tote additional gear.

Computerworld talked with three business executives who have overcome these wireless challenges through a combination of technical savvy and diligence. Here's a look at the lengths they go to in order to stay connected.

ROAD WARRIOR: Louis Rosenthal, executive vice president, ABN Amro Holding NV

WHERE HE ROAMS: He regularly travels between offices in New York and Chicago; he also visits ABN Amro's Amsterdam headquarters.

Rosenthal packs a cellular laptop data card from Sprint PCS Group and another card that hooks him into the data network of Bedminster, N.J.-based Verizon Wireless, both of which run their networks on the CDMA standard used primarily in the U.S.

Both cards provide between 50K and 70Kbit/sec. throughput, and when Rosenthal, who manages ABN Amro's technology infrastructure, can't get a signal from one carrier, he pulls out one card and pops in the other.

For e-mail, Rosenthal travels with a BlackBerry device [QuickLink a4520] from Research In Motion Ltd. in Waterloo, Ontario, that operates on the Global System for Mobile Communications standard, which assures him of coverage overseas and over a GSM network in the U.S. operated by AT&T Wireless Services Inc. in Redmond, Wash. Rosenthal says he also packs a GSM cell phone that provides him with global voice coverage.

He travels with a high-speed (11Mbit/sec.) Wi-Fi laptop data card and looks for free access wherever he goes — especially in Europe, where paid Wi-Fi access can run as high as $80 per day. He has also blanketed his home with Wi-Fi and installed a high-gain antenna so he can use his Wi-Fi laptop on his boat, which is docked at the edge of his property.

All these devices are necessary in an imperfect wireless world, Rosenthal says. "I'm out of the office virtually all the time, and not every carrier has service where you need it," he says. "I have to make sure I can get connected."

ROAD WARRIOR: Carl Oppedahl, patent attorney, Oppedahl & Larson LLP, Dillon, Colo.

WHERE HE ROAMS: He travels worldwide on trips that are completely dictated by client needs.

Like Rosenthal, Oppedahl travels with two cellular data cards, one for the Sprint PCS network and another that hooks him into the 100K to 130Kbit/sec. Enhanced Data Rates for Global Evolution (EDGE) service that AT&T Wireless offers nationwide. But Oppedahl says he has found EDGE service unavailable even at major hub airports, and he sometimes has to replace the EDGE card with the Sprint card to tap into e-mail from his laptop.

His e-mail connections are critical, Oppedahl says, because he has all his office voice messages forwarded to him as .wav files and all office faxes forwarded as TIFF files.

Oppedahl travels with a Wi-Fi router from SMC Networks Inc. in Irvine, Calif., that doubles as a print server. When he arrives at a hotel, Oppedahl says, he plugs the router into an Ethernet jack and uses it to send faxes and other documents to a portable printer.

Oppedahl uses a GSM cell phone from AT&T Wireless for overseas trips. He estimates his monthly airtime bill at $280: $80 each for data service from two carriers and $120 for the GSM phone. But the cost is worth it, he says, because "connectivity is critical to me. I have to respond to my clients no matter where I am. I have no option but to carry all these things."

ROAD WARRIOR: Dave Mathews, director of product innovation, RadioShack Corp., Fort Worth, Texas

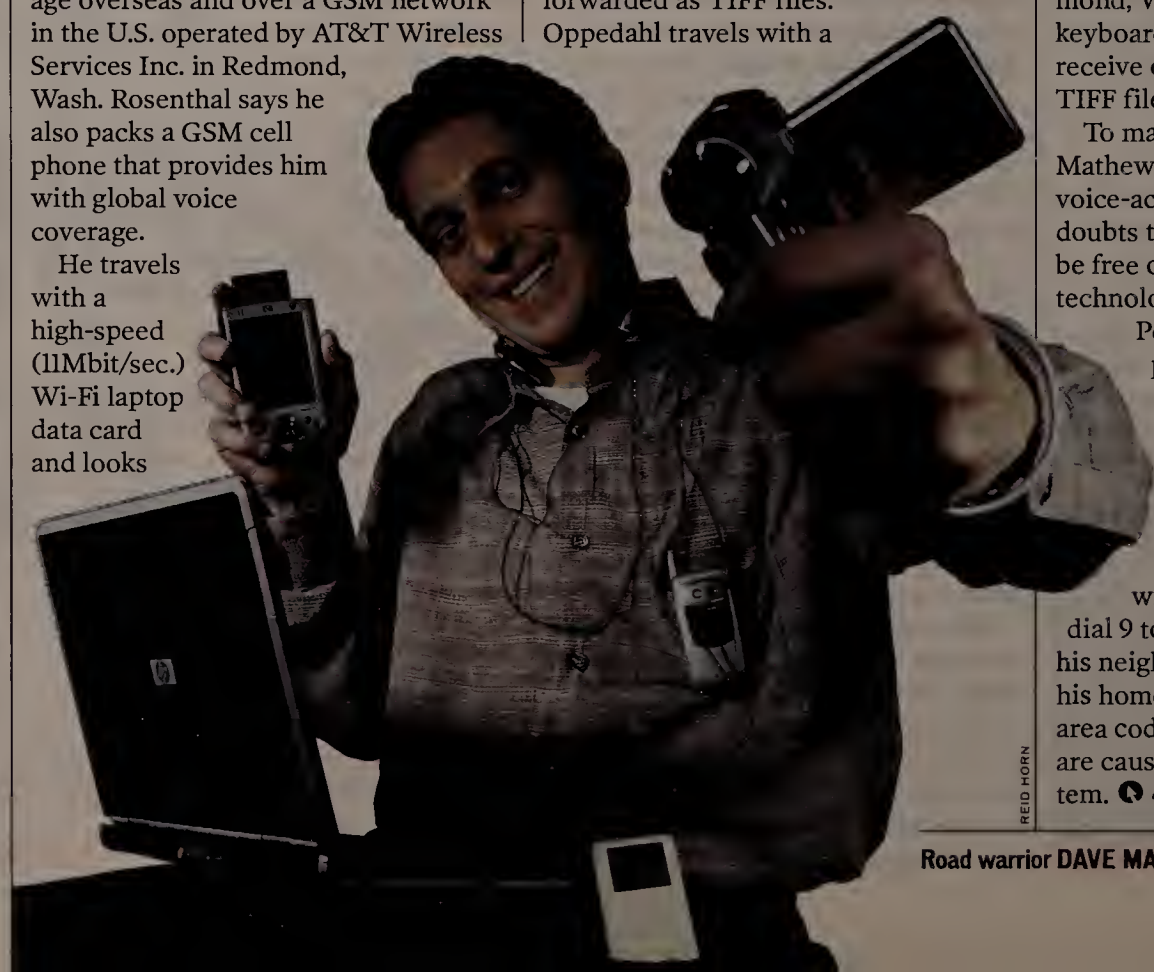
WHERE HE ROAMS: The majority of his travel is domestic, primarily to the East Coast, but also to Los Angeles, San Francisco and Seattle. His overseas trips are mainly to Munich, Paris and Zurich.

Mathews has his phone calls forwarded to him via voice-over-IP (VoIP) service from Vonage Holdings Corp. in Edison, N.J., that's installed at his home. If he's hooked up to a Wi-Fi network, Mathews says, he can answer those calls through softphone software he has installed on his laptop and PDA.

If he doesn't answer, the call is sent as a .wav file to his Sidekick smart phone, which runs on the GPRS network of T-Mobile USA Inc. in Redmond, Wash. Sidekick also has a full keyboard, so he can use it to send and receive e-mails and receive faxes as TIFF files.

To make voice calls on the road, Mathews uses a Sprint cell phone with voice-activated dialing. He says he doubts that mobile workers will ever be free of device clutter, not because of technology but because of ergonomics. People don't want to hold smart phones to their heads to make calls, he says, and regular cell phones are poor data input devices because their keypads and screens are small.

Being a pioneer has its drawbacks. Mathews says his wife doesn't like having to first dial 9 to make a call from home, and his neighbors don't understand why his home phone number has a different area code from theirs. Both anomalies are caused by quirks in the VoIP system. **45789**



REID HORN

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The Almanac

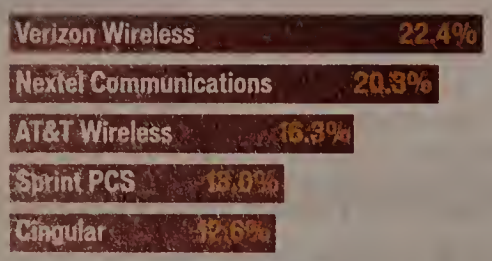
An eclectic collection of research and resources. By Mitch Betts

Broadband in the Air

Feeling out of touch on that cross-country or international flight? The Boeing Co. has announced pricing for its Connexion high-speed in-flight Internet service, which begins this spring on Lufthansa flights, followed by SAS, Japan Airlines, Korean Air Lines and others. The broadband service has metered pricing as well as flat-rate fees: $14.95 for flights less than three hours, $19.94 for flights between three and six hours, and $29.95 for flights more than six hours.

Breakdown of the Wireless Business User

Top wireless carriers used by business customers:



Base: Survey of 107,000 U.S. wireless subscribers in December 2003

SOURCE THE YANKEE GROUP, BOSTON

However, the aggregate numbers mask the fact that there are **three types of wireless business users**, and each type has different carrier preferences, The Yankee Group reports:

- **Corporate-liable subscribers**, whose accounts are directly tied to and paid for by the employer. LEADER: Nextel Communications Inc.
- **Corporate-sponsored users**, who fall under the corporate account but are individually liable for the charges. LEADER: Verizon Wireless (Sprint PCS Group is relatively strong too.)
- **"Prosumers,"** or professional consumers, who sign their own carrier contracts but put some or all of the costs on their corporate expense accounts. LEADER: Verizon Wireless

Force Wireless Carriers To Unlock Smart Phones

Planning to purchase smart phones — the ones with a calendar, e-mail and price tags of $300 to $500? Buyer beware: Carriers have placed locks on the phones that prevent them from being used on other carrier networks — the ultimate in vendor lock-in.

The locking mechanism is built into the phone's firmware, according to Meta Group Inc. Carriers generally refuse to unlock the phone because they want to limit customer churn.

"Enterprises exploring the purchase of high-end smart devices should force terms into the contract that require the carrier to unlock the phones," says Jack Gold, a Meta Group analyst. "This is important because many high-end feature phones are expensive and could have a life of more than three years — longer than most carrier contract terms."

Wireless PDA Updates Improve Hospital Service

Hospital patients change rooms and units — and nurses change shifts — which makes it hard to provide what hospitals call "continuity of care" and other industries call customer service. But Sacred Heart Hospital in Pensacola, Fla., is using a wireless system to give nurses much more information about each patient's medical needs and customer satisfaction.

As nurses make their rounds, they survey the patients about their preferences and concerns, and they record information on handheld devices or tablets. The information ranges from medications and allergies to emotional needs, and even whether the patient prefers tea or coffee or is a vegetarian, says Joana Adams, administrative director of patient care services. The data is synchronized with a central database so that the next shift of nurses "will see all of the issues from the previous shift or unit," she says.

The data can also pinpoint problems, such as a high number of complaints on one floor, and alert staff members about a patient who's had a particularly bad experience "so that we don't repeat that bad experience," Adams says.

The system was built by Pensacola-based Cogon Systems Inc., based on mobile database and synchronization technologies from iAnywhere Solutions, a unit of Sybase Inc. **46614**

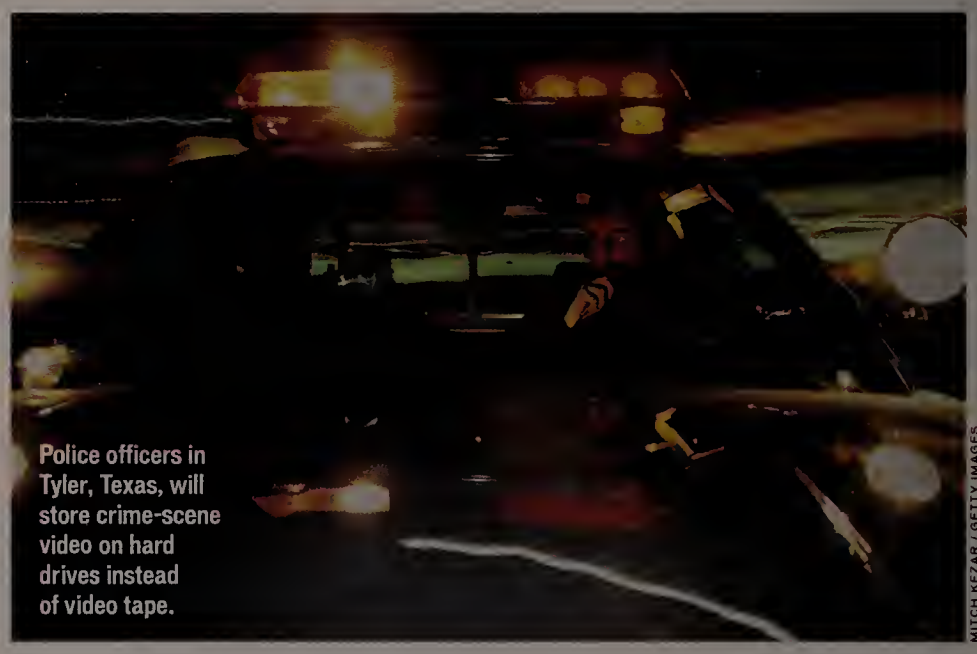
Conferences

- **Mobile & Wireless World**
  May 24-27, Palm Desert, Calif.
  www.mwwusa.com
- **Wireless & Mobile WorldExpo**
  July 21-22, Toronto
  www.wmworldexpo.wowgao.com
- **CTIA Wireless IT & Entertainment**
  October 25-27, San Francisco
  www.wirelessit.com

MORE RESOURCES

News, tutorials and a blog are available at our Mobile & Wireless Knowledge Center:

QuickLink k1000
www.computerworld.com



Police officers in Tyler, Texas, will store crime-scene video on hard drives instead of video tape.

MITCH KEZAR / GETTY IMAGES

Texas Cops to Get Digital Video System

A Texas police department plans to implement a digital video system and combine it with wireless hot-spot technology to allow police officers to broadcast video live from their patrol cars to headquarters. The system, developed by Coban Research and Technologies Inc. in Stafford, Texas, is being tested by the police department in Tyler, Texas (population 90,000), about 90 miles east of Dallas.

"Our current analog video cameras and computer systems are outdated," says police chief Gary Swindle.

The cutting-edge system, which IBM Global Services will begin installing this month, is expected to save the police department $50,000 each year compared with the analog system.

The digital video system will deliver better image quality, anti-tampering features and metadata for faster searching. The department has about 6,000 analog tapes in circulation. "With this system, the tapes go away. The video is stored in hard drives in the cruisers, and later on our servers. There's a tremendous labor savings there," Swindle says.

– Juan Carlos Perez, IDG News Service

SNAPSHOTS

Wireless Spending

After the communications industry, these are the U.S. vertical industries that will spend the most this year on wireless infrastructure and application services:

1. Transportation
2. Retail
3. Utilities
4. Education
5. Federal government
6. Process manufacturing

SOURCE: MARKET ESTIMATES BY IDC, FRAMINGHAM, MASS., MARCH 2004

Top Wireless Cities

U.S. metropolitan areas ranked by greatest wireless Internet accessibility:

1. San Francisco/San Jose
2. Orange County, Calif.
3. Washington
4. Austin
5. Portland, Ore./Vancouver, Wash.
6. Seattle/Bellevue/Tacoma, Wash.

SOURCE: INTEL CORP., APRIL 2004

Top Wireless Airports

U.S. airports with the most wireless hot spots:

1. Dallas-Fort Worth International
2. LaGuardia International (New York)
3. Atlanta Hartsfield International
4. O'Hare International (Chicago)
5. Baltimore/Washington International

SOURCE: INTEL CORP., APRIL 2004

MARK HALL

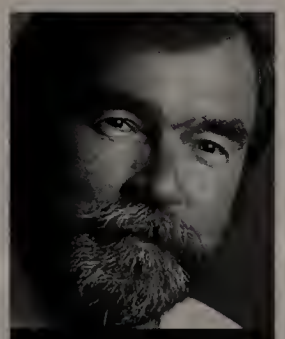
Still Worried About Wireless

Worried about your wireless network these days? Probably not. In 2002-03, you lost sleep over whether your wireless LAN access points were leaking information to warchalkers or competitors. Now security has been improved by more powerful encryption capabilities in the network. Rogue access points are under control. So you think you can put those wireless anxieties on the back burner? Well, swallow some more Pepcid — it's time to worry again.

WORRY NO. 1: SECURITY (STILL). Sure, you secured your WLAN on the corporate campus, and maybe even your branch offices have been locked tight. But what about my house and the millions of other home offices that use 802.11x technology? We're as insecure as ever.

Not that any hacker or practitioner of corporate espionage cares a whit about the keystrokes of an ink-stained wretch like me, but I bet your most talented developers — as well as your contract programmers, staff lawyers, product managers and C-level executives — use Wi-Fi technology in their homes. And I'm pretty certain your security team hasn't audited those networks to ensure that they're as hacker-resistant as your corporate LAN.

One of your 2004 projects should be to write up a list of key home workers and then drop by their houses for coffee. While there, secure those home networks.



MARK HALL is a *Computerworld* editor at large. Contact him at mark_hall@computerworld.com.

WORRY NO. 2: COMPLIANCE. Most CIOs are working hard on compliance issues to ensure that their CEOs and CFOs won't be asking Martha Stewart for tips on decorating their prison cells. You need to include wireless devices in that compliance process.

For example, if you're sending sensitive data to users with, say, a BlackBerry or Treo device, you need to make sure that relevant, auditable business processes can be applied to that device.

As instant messaging becomes more widely used on mobile devices for business, it will require tighter management and controls for competitive and compliance reasons. Companies like FaceTime Communications in Foster City, Calif., and IMlogic in Waltham, Mass., offer products that let you apply business process rules to every message. Keywords and phrases can be used to manage content in incoming and outgoing messages. Don't deploy corporate IM — wireless or otherwise — without considering compliance implications.

WORRY NO. 3: UPGRADES. Yes, I know, you just finished the big wireless rollout for your inventory operations or your branch offices. But there's new technology on the way that will make upgrading a compelling idea. Multiple-input-multiple-output (MIMO) technology [QuickLink 45320] promises wireless network performance at about 100Mbit/sec. And just three years ago, we thought 2Mbit/sec. wireless networks were the coolest.

A MIMO-enabled sending device uses two powerful radio frequency antennas to split its data transmissions. By using two streams of data and recombining them at the receiving end, it's possible to get better performance and higher capacity. MIMO chip sets are available now and are expected to start appearing in products late this year or early next. Soon thereafter, I expect you'll be replacing a lot of wireless gear because the speed is vastly better than what you have with today's 802.11 devices. Vendors claim MIMO is backward-compatible with previous releases of 802.11a/b/g products, which will make the swap-outs a little less painful.

WORRY NO. 4: HEALTH. Periodically, end users become concerned about how RF technology affects their health. You remember the stories about cell-phone-addicted real estate agents who developed brain cancer. And environmentalists have recently persuaded the U.S. Navy to alter its testing of extremely low-frequency communications systems because of their demonstrated deleterious effects on whales.

Technology like MIMO, which uses more powerful RF signals to achieve the higher performance, is likely to be a lightning rod for end-user health concerns. Naturally, the industry will offer knee-jerk claims that everything it ships is safe. True or not, those claims will be doubted by more than a few concerned individuals. But it's wise to bone up on any health issues surrounding RF, if only to set your users' minds at ease. In fact, when you roll out these advanced wireless systems, it's probably wise to include an analysis on the safety of RF.

So, while wireless systems are maturing quickly and proving themselves reliable and useful, they aren't becoming worry-free. **46026**

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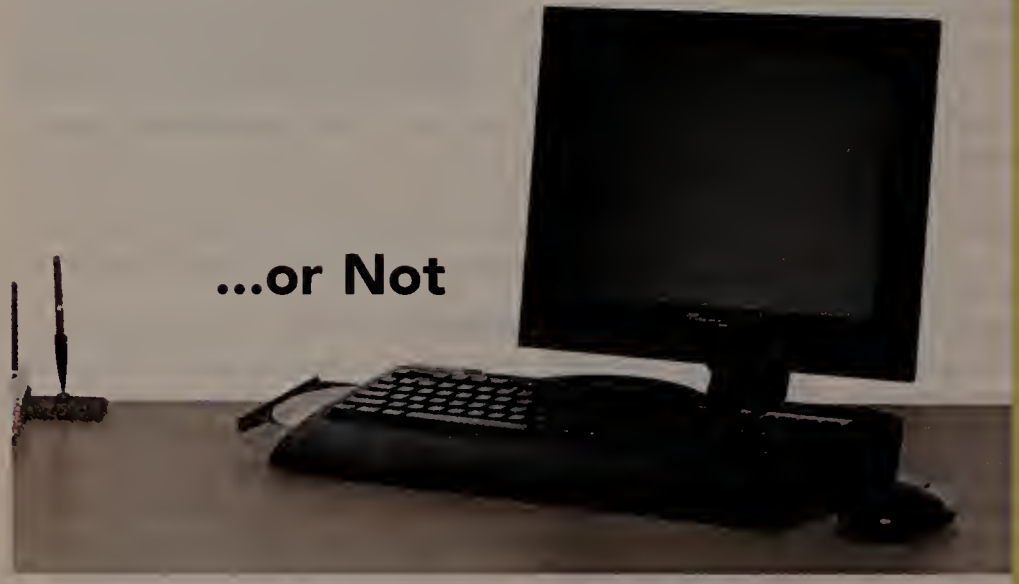

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Exceeds major server requirements for front door ventilation.	✓	✓	○
Meets or exceeds warranty requirements for all major servers.	✓	✓	○
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Vendor neutral rack configurator designed to support most third party servers and networking devices.	✓	✗	○
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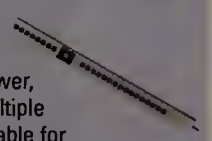

**Based on APC Internal Research and testing. ** See link on promotions page for terms and conditions. † Source of average pricing: www.HP.com. Prices may vary or change from time to time. Not applicable to other SKU's or models.*

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Manager

(Glen Mills, PA and other locations throughout the United States). Manage client and consultant teams during tasks of writing Business Process Procedures (BPPs) and test scripts for unit testing and integration testing. Oversee staff development of Business Design Scripts (BDSs). Define, communicate, and control tasks of process designers, configurators, data mappers, trainers, job role definers, developers, and 3rd party vendors. Set up and monitor progress of unit and integration testing. Assist with the production of process designs, system configuration and documentation as it relates to the SAP Quality Management (QM) and SAP Materials Management (MM) modules. Provide training seminars to super users and business representatives on SAP functionality for the Quality Management (QM) module and Materials Management (MM) module. Provide expertise in integration points between Quality Management (QM) and other modules, such as PM (Plant Maintenance), SD (Sales & Distribution), MM (Materials Management), PP (Production Planning). Salary $100,895/year. Mon.-Fri. 9:00am-5:00pm.

The position requires a Bachelor's degree in Computer Science, Mathematics, Business Administration, Engineering (any type) or Information Systems (employer regards a foreign degree as equivalent to a U.S. Bachelor's degree as determined by an accredited education evaluation service) + 5 years experience in the job offered or 5 years of experience as a Senior Consultant or Consultant. Related experience must include at least 3 years of experience in SAP Quality Management (QM), modules; SAP Materials Management (MM) modules; Business Design Scripts (BDSs); Business Process Procedures (BPPs); and integration points between Quality Management (QM) and other modules such as PM, SD, MM and PP.

Please send your resume, referencing Job Order Number WEB 415991 to the: PA Dept. FLC Unit, 235 W Chelten Ave., Philadelphia, PA 19144. EOE.

SOFTWARE ENGNR

Resp. for testing, verification, config. & deployment of engnrg software sys. utillzed in the operation of co's chem. & biological facilities. Specific dutles incl: (i) devising stndrds & procedures for deployment of proprietary engnrg software; (ii) testing, configuring & implementing engnrg software for co's operations; (Iii) advising technical groups within co's Logistics & Infrastructure, Mechanical, Process Technology, Process Analyzer, Construction as well as Project Engnrg Groups with respect to engnrg software's compatibility with co's other software sys./tools; (iv) overseeing engnrg software's compliance with data integrity, incl. archival, retrieval & beckup functions; & (v) testing new hardware & software for entire co's tech. groups. BS in Electrical or Chem. Engnrg reqd. Must have working knowledge of Matlab, Visual Basic, Access, MS Excel es well as Honeywell Control Language to test & config. distributed control sys. for chem. plants. High moblility preferred. 40 hrs/wk, OT as reqd, 8 am to 5 pm, $66,730/yr. Qualified applicants pleese submit resume to: Site Manager, Beaver County CareerLink, 2103 Ninth Avenue, Beever Falls, PA 15010-3957. Please refer to Job Order No. WEB 417588.

IT PROFESSIONALS

Consultant

(Glen Mills, Pennsylvania and other locations through the U.S.). Under the supervision of Senior Managers, Managers, and Senior Consultants, assist in providing consulting services for implementation, testing, development, maintenance and enhancement of software applications utilizing the Rational Unified Process (RUP) methodologies as well as Integrated Justice industry standards, and accompanying technology/development tools including Visual Age for Java, Rational Rose, Rational RequisitePro, Rational ClearQuest, and environments including OS/390. Document system architectures in Unified Modeling language using Rational Rose. Conduct System Performance Monitoring. Implement unified change control and management procedures based on the Rational Unified Process (RUP) methodologies using Rational ClearQuest. Assist to formulate and define computer information system scope and objectives through research and fact-finding to develop or modify moderately complex information systems tailored to client management requirements. Assist in analyzing and revising existing system logic difficulties and documentation.

Salary is $81,000 per year. Mon-Fri, 9:00 am to 5:00 pm. The position requires: Bachelor's degree or equivalent in Computer Science, Math, Engineering (any), Information Systems or Business Administration + 2 years of experience in the job offered or 2 years of experience as a Systems Analyst or Consultant. Related experience must include at least one year of Rational RequisitePro, Rational ClearQuest, Rational Rose, Integrated Justice Industry Standards, Visual Age and OS/390.

Please send your resume, referencing Job Order Number **WEB-415763** to the: PA Careerlink, FLC Unit, 235 W. Chelten Avenue, Philadelphia, PA 19144. EOE.

MA based Company has openings for Software Engineers & DBA's: (Multiple openings): Research, Analyze, Design, Develop, Test, diagnose, and implement various business applications.

Implementing, upgrading and supporting Oracle Financial Applications 10.7NCA/11i or Oracle HR, Payroll, Training and Administration. PL/SQL, SQL*Plus, SQL*Loader, Discoverer 2000, Developer 2000, OAS, Forms (6i), Reports (6i), TOAD, experience on AP, GL, PO, FA, CM, PSB, SYSADMIN & AR Modules. Oracle DBA, Oracle Utilities, Unix Shell Scripting, PL/SQL, Erwin Data Modelling/Designing. Interwoven TeamSite, Installing and upgrading Teamsite, Templating, WorkFlow Management, Content Management System, Open Deployment, MetaTagger, ASP.NET, C#, Visual Studio.NET, XML, XSLT, SQL SERVER2000, Oracle9i. Dreamweaver 4.0 MX, Crystal Reports6.0, Lawson Application 8.X,Unisys 2200,Sun Solaris 2.9, Teradata Datawarehouse,COBOL,JCL,VSAM,CICS ,DB2,MVS,IMS,VSAM,Expeditor, Spufi,File-aid, PMX, EDI Gentran / Mercator, AS/400,ILE-RPG IV, CL/400, SQL/400, MAPICS, Query/400 and DB2/400,Lotus Notes, PeopleSoft HR/Financials, BAAN ERP, BAAN tools, SAP R/3 and ABAP/4, Web Technologies like Java, J2EE, JDBC/ODBC, Websphere, MQ Series, EJB, C/C++, Visual C++ (MFC), Embeded Systems, Win32 API, Visual Basic 6.0, ATL COM/DCOM (MTS2.0), CORBA, Tuxedo, .Net Webservices, Cold Fusion, CFMX, Datawarehousing Informatica and Datastage. SAS 8, WinRunner 6.0, Silk, Load Runner, Rationel Suite, SQA Suite.

DBA's must have experience in installation, migration, moving, setup, monitoring and trouble shooting of various detabase applications. May require travel to client sites. Software Engineer $78,000 & up; DBA: $60,000 and up. Mail resume to CRG Inc, 222 Turnpike Road, Suite# 9B, Westboro MA 01581.

Computer

Monarch Info & Technological Services, Inc., an IT Co., has openings for Software Engineers & Programmer Analysts. Candidates must possess BS degree in CS, Engineering or related field plus 2 yrs of progressive exp. Send resume w/sal reqmnts to:

8891 Watson St., # 201
Cypress,CA 90630
email:
resumes@mitsinc.com

QA Test engineers (TE3&TE4) West Hills, CA. QA design, validation, benchmarking, maintenance & troubleshooting integrated & optimized financial software. Define Test Objective, Modules & Regression Testing for Siebel CRM. Environ: C++, Siebel VB, PL/SQL, SQL Server, Java program & script. Req: BS/CS/ENGG. Exp: 3 yr (TE3), 5 yr (TE4) including 2 as QA/test Eng. Exp in Testing Tools (eg. WinRunner, TestDirector, LoadRunner), Siebel testing (TE4 only) or validation, regression & performance testing. Resumes: N. Green, (ref: QA), S1, 3500 Lenox Rd, # 200 Atlanta GA 30326.

Product Analyst: Req. Bachelor's degree in Computer Science or related field plus 1 yr relevant exp to perform the following duties: write & maintain business system reqs. for software products; interact & communicate with C++, HTML & XML programmers at technical level; review, prioritize & advocate for end-user needs; perform data & statistical analysis; conduct user training; perform system testing; deploy applications. Exp. may be obtained prior to degree. Liquidnet, New York, NY. Fax resume to 646-674-2085. Ref. job title. No phone calls.

SYSTEMS ANALYST

Jacksonville, FL full time position to analyze user requirments, procedures, and problems to automate processing or improve existing computer systems. Plan and design Windows and Unix Based Client Server Web. C++, Visual Basic and Oracle systems. Competitive salery; Must have 2 years experience as a systems analyst. **Mail resume-to: Elite Information Services, Inc.,** 2021 **Art Museum Drive, Ste. 110, Jacksonville, FL 32207. Attn: F. Thomas.**

Ringtone Tool Software Development Leader wanted by comp s/ware dvlpmt Co. Must have Bach in Comp Sci or related + 5 yrs exp reqd. Knowl of web applic prgmg & WAP reqd. Must be fluent in Japanese & English. Respond to: hr@improvista.com

Usability Architect to develop user-oriented interfeces based on Cognitive Ergonomic/HCI principles. Requires Masters degree with focus in HCI, plus 2 yrs. experience as Usability Engineer involving computer software development including cognitive task analysis, usability testing, heuristic evaluation, inferential statistical analysis, advanced web technology (AS-400, HTML, WebServer and computerized graphics design) and Yield Management principles. Send resume to IS Humen Resources, Attn: JMVL, Crawford Group, 600 Corporate Park Dr., St. Louis, MO 63105.

S/W Eng sought to perf prod design, sys anelysis, & prog activities w/in s/w dev lifecycle; write functional & design specs, prep tech doc of prod sub-sys, conduct unit testing, integration testing; perf s/w defect verification, release testing, & beta support. Bach degree + 2 yrs s/w dev exp in SS7-based apps req'd. Must have knowledge of SS7, ISDN User Part, standardized telecomm testing tools, des/dev C/C++ apps, multi-threaded & multi-process TCP/IP based sys in UNIX environment, & Oracle DB apps. Contact Lightbridge, Inc., 320 Interlocken Pkwy, Broomfield, CO 80021 (Attn: Pat Jensen) w/ 2 resumes. Job #1465.0110

Programmer Analyst w/exp to analyze, design & develop applications to implement Straight Through Processing using SWIFT 15022 standards for foreign exchange, fixed income, equities, derivatives, future & options types of trede messages. Use object oriented technologies with C++, C, Perl, Shell Scripting, MQ Series, Oracle PL/SQL, Sybase, Sybase Replication Server & MS SQL Server. Use Mercator, FS-Manager Suite, TIBCO-RV, Erwin, Rational Unified Process and V-Shell server on Win XP/2K/AIX/Solaris & VMS. Mail Res to: Open Systems Technologies, Inc., 8 Winter Street, 6th Floor, Boston, MA 02108.

Programmer Analysts needed et client sites to dsgn & dvlp J2EE appls using Java2, UML, Dsgn Patterns, XML, Solaris 9, RDBMS (Oracle), OODBMS (Versant), CORBA, Rational ClearCase/ClearQuest, Borland AppServer, Perl, MQSeries, LotusNotes/Domino for telecom, credit & finance domains. Apply to: Hireme, Global Consultants, 25 Airport Rd, Morristown, NJ 07960.

Dictaphone Corp. looking for Principle Engineer for our Stratford, CT office. Must have M.Sc. degree in Comp. Sc. or related field & 5 yrs. of exper. dvlping. telecom. & web-based embedded prods., incl. at least 3 yrs. of exper. dvlping. call recording systs. on QNX platform, as well as exper. dvlping. network parsers, network device drivers, packet filtering, & packet sniffing, & programming w/ C/C++. Please send resume to HR Dept., Dictaphone Corp., 3191 Broadbridge Avenue, Stratford, CT 06614. AD CODE - JP.

Software Engineers for our Naperville, IL and Charlotte, NC offices. Design & Develop software applications using C++, Oracle, Sybase, XML, Coolgen, Interwoven, ClearCase, ClearQuest, Plumtree, ITS, PVCS, UNIX. Bachelors or Equivalent req'd in Computers, Engineering, Math or related field of study +2 yrs of related exp. 40 hrs/wk. Must have legal authority to work permanently in the U.S. Send resume to HR Manager, Softsol Resources, Inc., 184 Shuman Blvd. Ste. 200, Naperville, IL 60563.

Computer Support Specialist - provide computer support, implemt & maintain networked computer system & security for system. Assist in menag'g database, develop customized reports thru integrated system for process'g inventory levels, purchas'g, sales & invoic'g. Assist in develop'g websites, modif.s & tech. Investigate & resolve user's softwere & hardware problems. Train users & answer inquiries re e-mail, op'g systems & programm'g languages. 35 hrs. 2 yrs exp reqd. Fax resume & salary reqmts to (305) 373-5596, Attn: Mr. Baid, Kerats & Facets.

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PROGRAMMER ANALYSTS for Raleigh, NC office. Develop & maintain software applications using Oracle, SQL Server, Erwin, Linux, Sybase, XML, UML, Interwoven, Coolgen, ClearCase, ClearQuest, Plumtree, PVCS, UNIX. Bachelors or Equivalent reqrd in Computers, Engineering, Math or related field of study + 2yrs of related exp. 40 hrs/wk; Must have legal authority to work permanently in the U.S. Send resume to HR Manager, Globalways, Inc, 184 Shuman Blvd. Naperville, IL 60563.

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Software Developer, Sunrise, FL (f/t) - dvlp & implement web based mortgage applics. & installations prog.; dsgn & migrate svcs to new techs & create plugs-ins. Use C++, C-Tree, InstallScript, XML, SQL, TCP/IP, COM, MFC & WinSock. Offering prev wage. Rqts: MA/MS in comp-related field & 2 yrs work exp w. above techs. Resume to: Alan Newman, Mortgage Systems, 1643 N Harrison Pkwy, Bldg H, Suite 200, Sunrise, FL 33323

Computers - Product Specialists needed. Seeking qualified candidates possessing BS or equivalent and/or related work experience. Duties include: Design, develop & implement financial payment processing software products in the areas of Card Issuing & Management, Internet Payment processing, Interchange transaction reconciliation and Data warehouse MIS systems; Work with Oracle, Sun Solaris, J2EE, Unix & C++. Exp. with ENSCRIBE, PATHWAY, TAL, Non Stop SQL, BEA Tuxedo, RACAL HSM a plus. Fwd. resume & references to: Opus Software Solutions, Inc., Attn: HR, 1480 Route 9 North, #203, Woodbridge, NJ 07095.

Computer Software Associates (ICSA) is looking for IT professionals to customize applications for clients and business develop and operation analyst to promote IT business & placement. BS/MS or equivalent required. Must have related experience. Please contact raghuponnala@icsa-us.com. EOE

Anacon has openings for IT professionals (software engineers, programmer/system analysts). Candidates must have BS/MS, one-year experience is a minimum. Skills in areas of C, Cobol, Oracle, SQL, Sybase, DB2, PeopleSoft, SQA, VB are plus. Contact anacon@anacon.com. EOE

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PROG. ANALYST - APPLNS BUILD

Dvlp customized applns for single consolidated build for all Windows Service, ASP & ASP-.net files for financial institutions. Config. & create installtn docs to client framework specs. Create directories & perform white & black box testing. BS in Comp. Sci., MIS, Electrical or Electronics Engnrg + 3 yrs exp. in job offered or in Software Engnrg using Applns Build reqd. Must know KONDOR, NAnt, Concurrent Versions Systems, Symantec Visual Café, ASP.net, J2EE and financial industry experience. High mobility preferred. 40 hrs/wk, OT as reqd, 8 am to 5 pm, $66,730/yr. Submit resume to: Manager, Butler County CareerLink, Pullman Commerce Center, 112 Hollywood Drive, Suite 101, Butler, PA 16001-5699. Please refer to Job Order No. WEB 417195.

IT PROFESSIONALS

Manager

(Glen Mills, Pennsylvania and other locations through the U.S.). Oversee technical engagements for major corporate clients. Meet with client management to assess strategic planning and business operational requirements in order to determine engagement scope, staffing, and budget. Understand industry specific business processes, identify trends and define the impact of those trends, provide information to clients regarding the potential impact of industry, legislative or regulatory changes. Review engagement plans with assigned professional staff and oversee analysis of client business operations and engagement issues including financial, production, and management related projects. Utilize technical experience with entire systems integration cycles, including Rational Requisite Pro, Rational Rose, Rational Suite Development Studio and proficiency in multiple programming environments such as C/C++, Lotus Notes, as well as relational database management systems DB2. Oracle, SQL Server and Microsoft Access, to direct Systems Analysts and Programmers on engagements and ensuring quality control. Supervise the implementation of operational and system modifications by client corporations. Formulate and define systems scope and objectives for engagements.

Salary $101,000 per year. Mon-Fri, 9:00 am to 5:00 pm. The position requires: Bachelor's degree or equivalent in Computer Science, Math, Engineering (any), Information Systems or Business Administration + 3 years of experience in the job offered or 3 years of experience as a Senior Software Programmer, Senior Consultant or Software Programmer. Must have two years technical experience with Rational Tools (Rational Requisite Pro, Rational Rose); programming environments (C/C++, Lotus Notes) and relational database management systems (DB2. Oracle, and SQL Server). Employer will regard a foreign degree to be equivalent to a U.S. Bachelor's degree as determined by an accredited credential evaluation service.

Please send your resume, referencing Job Order Number **WEB-416009** to the: PA Careerlink, FLC Unit, 235 W. Chelten Avenue, Philadelphia, PA 19144. EOE.

Sr. Member of Technical Staff/CAD Eng. wanted by telecommunications company based in Bedford, MA. Must have M.S. in C.S. plus 1 yr. exp. including ASIC. Must be familiar with logic/physical design/optimization algorithms, logic simulation scheduling and IC design flow. Send resume to H.R. Dept., Attn: J.W., TranSwitch Corp. 3 Enterprise Dr., Shelton, CT 06484.

Required Senior Project Director to manage professional staff in IT discipline, manage and enhance customer relations and identify new business opportunities. Responsible for project planning, strategizing the delivery and working closely with the onsite / offshore team to ensure smooth delivery. Manage the operational, financial, and technical performance of the program. Maintain an environment to promote professional growth and staff development. Manage relationships between existing clients and potential new clients. Provides leadership and guidance to staff. Must be a solution-oriented individual. Will identify business development strategies. Master's degree or equivalent with a concentration in Management/related studies with 3Yrs. experience in job offered or in job involving overall responsibility for operation of independent business unit. Candidate must demonstrate experience managing multi-discipline, results-driven programs. Candidate with engineering background req. Checkable references req. Salary: $100,000/Yr. Send this Ad. & 2 copies of your resume/letter of qualification to: Job Order 2004-131, P.O. Box 989, Concord, NH 03302-0989.

System Analyst in Fairfax, VA

To monitor, test, analyze and troubleshoot wide network of users, maintain integrity of web data network. Experienced in client server, Internet and/or Web testing Knowledge of Web technologies, Knowledge of Bug Tracking System. Familiarity with MP3 tech, play streaming audio an the Internet and in HTML. Exp in maintenance, and/or trouble shoot of data network. Maintenance of software quality docs, testing checklist. Enter And Maintain bugs into Defect Tracking System. Self-Motivated. Ability to multitask. Time mngmnt and org skills. Strong technical writing skills B.S. in Comp. Science, or related field and 2 yr exp. Attractive salary.

Fax resume to Attn: H.R. Arab Media 703-968-4486.

Programmers & Software Engineers: Design/Develop Server side/GUI/web enabled apps. in Microsoft.Net/ related tools suite, Java suite, SQL Server/Oracle, Coldfusion, COBOL, Data Dictionary/Data Diagram, AS400 & rel. tools. Attn: HR, 6962 Main St., Suite 105, Woodstock, GA 30188.

CRM Software Development Manager. Multiple openings. Responsibilities include: management including hands-on design, development and implementation of Internet/Intranet/Web-based Customer Relationship Management (CRM) software systems using Microsoft Visual C++, Visual Basic, O-O Modeling, COM/COM+, IIS, ASP, XML, XSL, XML Schema, CSS, Java Script/VB Script, DHTML, ADO, PL/SQL, T-SQL, SQL Server 2000, Oracle DBMS, Microsoft Transaction Server, Visual Interdev, MS Project, Visio, Microsoft VB.NET, Biztalk Server 2000, Rational Rose, Windows 2000 Advanced Server; manage the design and development of n-tiered web architectured applications; and perform budgetary and price analysis for CRM development projects. Must have a Master's Degree in Computer Science or a related field and three years of experience as a Software Engineer or in a related occupation, or a Bachelor's Degree in Computer Science or a related field and five years of experience as a Software Engineer or in a related occupation. If interested, submit resume in duplicate to:

Ms. Cassandra M. Stewart
Human Resources and Office Manager
CAS Systems of America, Inc.
1100 Abernathy Road
Building 500, Suite 750
Atlanta, Georgia 30328

Systems Analyst (CO). Design, code, test & enhance various components (including GUIs) for convergent billing mediation solutions including ST500i & ST5000i & Record Keeping Servers (RKS) for packet cable. Estimate development & testing efforts. Prepare Rational Rose diagrams, detail analysis & design documents. Manage system builds & system integration. Performed duties using latest technologies such as COBOL, C, C++, JAVA, JCL, ORACLE, MS Access, SQL Server, Lynx, Unix, Solaris, HTML, XML-XSLT, ASP, VB Script, Java Script, & Rational Rose 98. BS/MS in Computer Science or any Engineering or related field, plus relevant experience. Send resume to Vivian Fernandes, Manager Resource, MBT International, Inc., 8310 South Valley Highway, 3rd Floor, Englewood, CO 80112.

COMPUTER

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Analyze, diagnose and troubleshoot business software application issues of Latin American customers. Identify defects on the product and communicate with Development as needed; B.S. CS/MIS or equiv and 2 yrs. that includes PROGRESS 4GL, PROGRESS DB, ADM, Activex and AppServer; distributed computing, Java, SQL-92, Web technologies, and HTML. Exp. resolving customer issues. One position fluent Spanish req; one position fluent Portuguese req.

Principal Software Engineer/ Architect - Req # 550
As a senior technical leader on the Open Edge Dynamics development team, specify, design, develop, integrate and document new middleware product features and deliver against aggressive schedules. Analyze business requirements, and translate them into technical solutions for customers. B.S. CS or Bus or equiv. + 5 yrs exp., 3 of which must be in design and development of complex middleware products. Exp. must inc. PROGRESS Dynamics and large database design with ERWIN.

Interested applicants should submit resume to: S. Fernandois, Legal Dept., Progress Software Corporation, 14 Oak Park, Bedford, MA 01730- Equal Opportunity Employer. For Immediate consideration, please visit our career page at http://careers.peopleclick.com/Client40_ProgressSoftware/BU1/External_Pages_PSC/Jobsearch.htm and apply on-line, refering to the requisition # for the position for which you are applying.

Computer systems control coordinator: Manage central-site Linux, Solaris, Windows, Mac server and TCP/IP networking hardware and software; Administer user accounts and security mechanisms on servers; Develop, customize, and optimize server software and network applications; Provide training and consultation to end-users and other support staff; Recommend policies and procedures to effectively administer enterprise network services. Implement university wide integration of Linux, Solaris, and Windows Active Directory using LDAP, Kerberos, PAM, and C language. Req. BS or equivalent in CS. Must be proficient in Linux/UNIX internal, C, PERL, AD, LDAP, and Kerberos. 40 hr/wk, 8-5. Send resume to Joe Brenton, University of North Florida at 4567 St. Johns Bluff Road, South, Jacksonville, FL 32224.

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Please send resume, indicating job code, to: **Human Resources, SeeBeyond Tech. Corp., 181 West Huntington Drive, Monrovia, CA 91016 or contact us at hire_me@seebeyond.com.** EOE

SEEBEYOND

Development System Architect (Waltham, MA) Perform independent & original research and development in operation support systems for telecommunication network operations. Resolve systems design & implementation problems. Provide conceptual solutions to satisfy business requirements. Provide technical evaluation of hardware, software, tools and procedures. Determine the impact of proposed changes on system architecture and provide technical solutions. Recommend effective design methodologies. Design, analyze, estimate and implement service requests using Windows NT, Unix, C/C++, Java and SQL. Monitor system performance to identify areas that need improvement. Guide, instruct, and monitor team members in coding techniques, technical and user procedures and company/project standards. The position requires a Master's Degree in Computer Science or Computer Engineering & one year of prior experience in the job offered or in the related occupation of Research Assistant, Teaching Assistant or Engineer. The one year or prior experience must include experience with Windows NT, Unix, C/C++, Java and SQL. $92,840/year, plus usual corporate benefits, 9 AM - 5 PM, 40 hrs/wk. If interested, please mail two copies of resume to Case #200203889, Division of Career Services, Labor Certification Unit, 19 Staniford Street, 1st Floor, Boston, MA 02114. Must have proof of legal authorization to work in the United States.

The University of Tennessee Knoxville, OIT Administrative Applications, is recruiting an IT Analyst, which is a staff exempt position. The position requires a BS in Comp Sci, Math, Engg, or IT and 2 yrs. exp. involving programming in ABAP/4 & work w/ SAP FI/CO, MM, & HR modules. Applicants should send resumes to Ms. Gayle Mathews, OIT Business Office, 2515 Dunford Hall, Knoxville, TN 39776-4060. EOE.

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IT Professionals

Seeking qualified candidates for Sr. & mid-level IT professional positions including: Programmer Analysts, Database Administrators, Software Engineers, IT/Software and similar type positions. Candidates must possess MS/BS or equivalent and/or related work experience. Please mail resume and references to:

Patel Consultants Corp.
Attn: HR
1525 Morris Ave.
Union, NJ 07083 EOE

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Sales Manager / Marketing Manager: must have at least 2 years of Sales experience, BA degree or foreign equivalent degree and basic computer skills. Multiple positions exist at various sites across the US. Please mail your resume to: Recruit. Dept. Ref. #CW05-04, Magna Infotech Ltd., 1 Padanaram Rd., Ste. 208, Danbury, CT 06811-4833.

Business Objects has an opening for the position of Sr. Consultant to be based out of our San Jose, CA office.

The position requires a Bachelor's or foreign degree equivalent in CS/IS/Business or related field plus five years of work experience as IT, software consulting or related. The job duties include: Implement, analyze, design and delivery Business Objects Decision Support Systems for F1000 customers. Complement the service offerings of consulting firms, systems integrators, and large customer personnel in architecting, designing, implementing, and integrating business solutions in the enterprise. Identify all technical requirements within assigned account for delivering the solutions directly and for working with corporate support personnel, sales management, and the Field Sales personnel to resolve any technical issues or requirements. Provide technical solutions to customers while identifying new opportunities. Travel extensively throughout the U.S.

To apply for a position, visit our website at www.businessobjects.com/careers or forward your resume (ref CW0304) to: Business Objects Americas, Attn: Staffing, 3030 Orchard Pkwy, San Jose, CA 95134. EOE

Software Engineer

Person will be responsible for design, develop and test computer software for various clients. Analyze software and design CDMA wireless networks. This will be using UNIX (solaris) Windows-NT Operating Systems and Programming languages such as XML and Databases such as MS Access along with other Tools such as Purify, Clear Case, Rational Rose, Sun Workshop and Rogue Wave Classes. Rate of Pay: $95,222 per year, Hrs:40/wk (8am-5pm). Must have bachelor's degree in Computer Science, Physics or related field + 4 years as a Computer or an Information Technology Programmer Experience. Mail resume to: Case # 200203627 Labor Exchange Office 19 Staniford St., 1st fl, Boston, MA 02114.

SOFTWARE ENGINEER to design and develop computer programs to test business applications using Oracle, Oracle Financials, SAS tools, Apache and SQL, as well as testing tools including WinRunner, Test Director and Astra Quick Test on Linux, HP UX and UNIX platforms; Instal and set up Rational Unified Process in software development life cycle; Create and execute testing scripts using C and Visual Basic; Set up and configure Load Runner to perform smoke, bounce, stress, integration, architecture and functionality specific performance monitoring of web applications; Develop test result summary report based on mean, median and statistical analysis of test results using Rational Robot; Develop test strategies, test plans and quality assurance schedule for all tests to be performed. Require: B.S. degree in Computer Science, an Engineering discipline, or a closely related field with 2 yrs of exp in the job offered or as a QA/ Systems Analyst. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Send resume to: Ahn Chi Yong, Lightning Technology Solutions, Inc.; 2526 Mt. Vernon Rd, Ste B, # 307, Dunwoody, GA 30338; Attn: Job JS.

Credit Management Consultant. Job location: Norcross, GA. Duties: Resp. for project mgmt of install. of software pkg., Debt Manager. Provide guidance on all aspects of business & funct. design of install. Analyze customer reqrmnts. & perform gap analysis against Debt Mgr product. Identify data require. & map data to & from external systems. Advise on approach to testing & data migration & oversee when required. Configure pkg. parameters & troubleshoot tech. problems. Ensure projects are delivered on time & w/in budget. Requires: B.S. in Comp. Sci., Eng. or related field (will accept any comb. of educ. & exp. equiv. to B.S. degree) & 3 yrs. exp. in the job offered or 3 yrs. exp. as a Consultant or Mgmt. Consultant. Concurrent exp. must incl.: 3 yrs. exp. using Debt Manager & 3 yrs. exp. in project mgmt of software install. Send resume (no calls) to: Sharon Penn, LBSS, Inc., 3550 Engineering Dr., Ste. 200, Norcross, GA 30092.

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SOFTWARE ENGINEER to design, develop, deploy and maintain application software using J2EE, EJB, Servlets, Struts, JSP, WebLogic, WebMethods, WebSphere, LDAP, SiteMinder, UML, Rational Rose, XML, XSLT and Oracle on Sun Solaris and Windows platforms. Require: B.S. degree in Computer Science, an Engineering discipline, or a closely related field with 4 yrs of experience in the job offered or as a Systems Engineer. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Apply by resume to: Jun Ying, Meritsoft, Inc., 2227 Wayside Drive, Suite 201, Atlanta, GA 30319; Attn: Job JL.

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Maryfran Johnson,
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Don Tennant, News editor.....(508) 620-7714
Craig Stedman, assistant News editor.....(508) 820-8120
Mitch Betts, Features editor.....(301) 262-8243
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Lucas Mearian, financial services; storage; IT management.....(508) 820-8215
Linda Rosencrance, general assignment; transportation/carriers.....(508) 628-4734
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Patrick Thibodeau, enterprise systems; outsourcing and immigration issues; corporate antitrust issues.....(202) 333-2448
Dan Verton, federal/state government; legislation; critical-infrastructure security; travel.....(703) 321-2277
Jaikumar Vijayan, corporate security/privacy issues; manufacturing.....(630) 978-8390
Todd R. Weiss, general assignment; Linux; messaging/collaboration.....(717) 560-5255

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Frank Hayes, senior news columnist.....(503) 252-0100

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Mark Hall, editor at large.....(503) 391-1158
Gary H. Anthes, national correspondent.....(703) 536-9233
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Sharon Machlis, managing editor/online.....(508) 820-8231
Ken Mingis, online news editor.....(508) 820-8545
Marian Prokop, online editor at large.....(508) 820-7717
David Ramel, e-mail newsletter/online editor at large.....(508) 820-8269
John R. Brillon, associate art director.....(508) 820-8216
David Waugh, associate art director.....(508) 820-8142
Peter Smith, Web development manager
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Bill Rigby, associate Web developer
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RESEARCH

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COPY DESK

Michele Lee DeFilippo, managing editor/production.....(508) 820-8126
Bob Rawson, assistant managing editor/production.....(508) 271-8015
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Stephanie Faucher, design director.....(508) 820-8235
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ADMINISTRATIVE SUPPORT

Linda Gorgone, office manager.....(508) 820-8176
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CONTRIBUTING COLUMNISTS

Pimm Fox, Michael Gartenberg, Dan Gillmor, Paul Glen, Barbara Gomolski, Thornton A. May, David Moschella, Bart Perkins, Nicholas Petreley, Paul A. Strassmann

CONTRIBUTING WRITERS

Mary Brandel, Russell Kay, Sami Lais, Robert L. Scheler, Steve Ulfelder

GENERAL INFORMATION

TELEPHONE/FAX

Main phone number.... (508) 879-0700
All editors unless otherwise noted below
Main fax number ..... (508) 875-8931
24-hour news tip line... (508) 620-7718

E-MAIL

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Page number refers to page on which story begins. Company names can also be searched at **www.computerworld.com.**

A.L. DIGITAL LTD. 12
ABN AMRO HOLDING NV 44
ADVANCED MICRO DEVICES INC. 1
ADVANCED VOTING SOLUTIONS INC. 5
AIR PRODUCTS AND CHEMICALS INC. 1
AIRESPACE INC. 40, 41
ALCATEL 40, 41
ALINEAN LLC 31
ALLINA HOSPITALS & CLINICS 20
AMR RESEARCH INC. 25
APRIMO INC. 16
ARC ADVISORY GROUP INC. 25
ARC INTERNATIONAL GROUP 25
ARCTIC CAT INC. 8
ARUBA WIRELESS NETWORKS INC. 40
ASSETPOINT 25, 28
AT&T WIRELESS SERVICES INC. 12, 42, 44, 46
AUGMENTIX CORP 6
BANK OF ALAMEDA 9
BAYLOR UNIVERSITY 9
BEA SYSTEMS INC 4
BLUECROSS BLUESHIELD OF TENNESSEE INC. 4
BLUETOOTH SIG 12, 29
BRAINSTORM GROUP INC 34
BROADLANE INC. 20
BURTON GROUP 42
CEC EUROPE SERVICE MANAGEMENT LTD. 8
CH2M HILL 28
CINGULAR WIRELESS LLC 42, 48
CISCO SYSTEMS INC. 6, 9, 31, 40, 41
COBAN RESEARCH AND TECHNOLOGIES INC 48
COGNOS INC 29
COGON SYSTEMS INC. 46
COMPUTER SECURITY INSTITUTE 34
COUNTERPANE INTERNET SECURITY INC. 9
CTIA 46
CURRENT ANALYSIS INC. 16
CUTTER CONSORTIUM 1, 19
DARTMOUTH COLLEGE 40
DATASTREAM SYSTEMS INC. 25, 26
DELL INC. 4, 6, 25
DEUTSCHE LUFTHANSA AG 46
DHL INTERNATIONAL LTD. 1
DIEBOLD ELECTION SYSTEMS 5
DURANO GLASS MANUFACTURING CO. 25
EATON VANCE CORP. 19
EATON VANCE DISTRIBUTORS INC. 9
E-GOV INSTITUTE 34
EMC CORP. 4
ENTERASYS NETWORKS INC. 9
FACETIME COMMUNICATIONS INC. 47
FBI 9
FEDEX CORP 1, 12, 31
FIRST CONSULTING GROUP INC. 40
FLARION TECHNOLOGIES INC. 43
FLASHLINE INC. 6
FORRESTER RESEARCH INC. 1, 9
GARTNER INC. 1, 29, 34, 43
GATEWAY INC. 6
GENERAL MOTORS CO 31
GN NETCOM INC 29
GRAY & CO. 1
GREENPOINT CREDIT LLC 1
HANOVER COMPRESSOR CO 25
HARVARD BUSINESS SCHOOL PUBLISHING CORP 31
HEWLETT-PACKARD CO 4, 6, 29
I2 TECHNOLOGIES INC. 6
IANYWHERE SOLUTIONS INC. 46
IBM GLOBAL SERVICES 46
IBM 4, 5, 29, 54
IDEFENSE INC. 9
IMLOGIC INC. 47
INDUS INTERNATIONAL INC. 28
IN-STAT/MDR 42
INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC. 43
INTEL CORP. 1, 6, 40, 47
INTERNATIONAL COMPUTER NEGOTIATIONS INC. 34
IT INFRASTRUCTURE MANAGEMENT LLC 6
ITRONIX CORP. 29
JAPAN AIRLINES SYSTEM CORP. 46
JOHNS HOPKINS UNIVERSITY INFORMATION SECURITY INSTITUTE 5
KEANE INC. 19
KEYSPAN CORP. 1
KOREAN AIR LINES CO. 46
LEVANTA INC. 6
LEXUS 29
LINUXCARE INC. 6
MANULIFE FINANCIAL CORP. 5
MARITZ INC. 25
MCI INC. 1, 18
MCKINSEY & CO. 31
MCKINSEY GLOBAL INSTITUTE 31
MERCURY INTERACTIVE CORP 9
MERU NETWORKS INC. 41
META GROUP INC. 40, 41, 46
MICROMAIN CORP 26
MICROSOFT CORP. 1, 5, 6, 8, 9, 16, 54
MINCOM LTD 26
MONET MOBILE NETWORKS INC. 42
MOTOROLA INC. 29, 40
MRO SOFTWARE INC. 25, 28
NATIONAL PUBLIC RADIO INC. 42
NATIONAL SEMICONDUCTOR CORP 31
NEC AMERICA INC. 41
NEC CORP 41
NETWORK SERVICES CO. 20
NEXTEL COMMUNICATIONS INC. 42, 43, 46
NOKIA CORP. 12, 40
NORTEL NETWORKS LTD. 1, 40, 41
NOVELL INC. 1, 8, 54
OFFICE OF MANAGEMENT AND BUDGET 5
OHIO STATE UNIVERSITY 21
OPENPAGES INC. 29
OPNET TECHNOLOGIES INC. 9
OPPEDAHL & LARSON LLP. 44
ORACLE CORP. 6, 16, 25, 28
PEOPLESOFT INC. 6, 16
PEREGRINE SYSTEMS INC. 26
PERSHING LLC 4
PLANTRONICS INC. 29
POLYCOM INC. 1
PROXIM CORP. 40, 41
PUBLICIS GROUP SA 1
QSM ASSOCIATES INC. 19
RADIOSHACK CORP. 44
RE/MAX INTERNATIONAL INC. 42
RED HAT INC. 54
RESEARCH IN MOTION LTD. 44
SACRED HEART HOSPITAL 46
SALESFORCE COM INC. 16
SAP AG 6, 16, 29
SAS AB 46
SAS INSTITUTE INC. 16
SCHNEIDER NATIONAL INC. 1
SEQUOIA VOTING SYSTEMS INC. 5
SIEBEL SYSTEMS INC. 16
SMC NETWORKS INC. 44
SONY CORPORATION OF AMERICA 16
SONY ERICSSON MOBILE COMMUNICATIONS AB 12
SOPHOS PLC. 9
SPECTRALINK CORP 40, 41
SPRINT PCS GROUP 44, 46
ST AGNES HEALTHCARE 40
STORAGE TECHNOLOGY CORP 4
SUPPORT SOFT INC. 6
SYBASE INC. 46
SYMANTEC CORP 6
SYMBOL TECHNOLOGIES INC 40
SYSTINET CORP. 6
TASTY BAKING CO. 6
TDK SYSTEMS EUROPE LTD. 12
TELESYM INC. 40
THE BOEING CO. 46
THE BURLINGTON NORTHERN AND SANTA FE RAILWAY CO. 1
THE MOZILLA FOUNDATION 6
THE SHOSTECK GROUP. 42
THE YANKEE GROUP 20, 48
THERMO ELECTRON CORP. 9
TIBCO SOFTWARE INC. 6
T-MOBILE USA INC. 44
TRIMBLE NAVIGATION LTD. 40
TRUSECURE CORP. 9
TUFTS ASSOCIATED HEALTH PLANS INC. 19
U.S. CENSUS BUREAU 21
U.S. DEPARTMENT OF DEFENSE 5
U.S. GENERAL ACCOUNTING OFFICE 5
U.S. NAVY 47
U.S. SECURITIES AND EXCHANGE COMMISSION 1
UNICA CORP. 16
UNITED PARCEL SERVICE INC. 31
UNIVERSITY OF CALIFORNIA, BERKELEY 21
UNIVERSITY OF CALIFORNIA, LOS ANGELES 21
UNIVERSITY OF KENTUCKY 6
UNIVERSITY OF WASHINGTON BUSINESS SCHOOL 1
VANTAGE PARTNERS LLC 19
VERIZON COMMUNICATIONS INC. 31
VERIZON WIRELESS 42, 44, 48
VIGILAR INC. 12
VOCERA COMMUNICATIONS INC 40
VONAGE HOLDINGS CORP 44
WAL-MART STORES INC 20
WASTE MANAGEMENT INC 25
WEBMETHODS INC 5
WHEELABRATOR TECHNOLOGIES INC 25, 28
ZYXEL COMMUNICATIONS CORP 41

ADVERTISER'S INDEX

American Power Conversion www.apcc.com 888-289-APCC 49
Business Intelligence Perspectives www.biperspectives.com/cw 28/29
CeBIT America www.cebit-america.com 24
Computer Associates www.ca.com 13
Cybernet Manufacturing www.cybernetman.com 48
EMC www.emc.com 35*
Harvard Business School Press www.HBSPress.org 33
Hewlett-Packard www.hp.com 30*
IBM eServer www.ibm.com 10-11
IBM Software www.ibm.com 22-23
Microsoft IT Heroes microsoft.com/officeIT 7
Microsoft Live microsoft.com/livecomm/trial 45
Microsoft Office microsoft.com/officeIT G1-1
Microsoft Windows Server System microsoft.com/wssystem 17
Mobile & Wireless World www.mwwusa.com 36
Nokia www.nokia.com 38-39
Salary Survey 2004 www.computerworld.com/takesalary2004 55
Samsung www.samsungusa.com 26-27
SAP www.sap.com 57
SBC Communications www.sbc.com 14-15
Sharp www.sharpusa.com 2
Sybase www.sybase.com 58
Xerox www.xerox.com 18, 19

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Continued from page 1

Microsoft

out since Windows Server 2003, such as Windows Rights Management Services and SharePoint Services.

R2 will also include support for the next release of Microsoft's Visual Studio .Net development tools, code-named Whidbey. Other new features will be aimed at helping companies deploy servers in branch offices and allow users to access intranet-based services from the Internet without having to go through a virtual private network, Muglia said.

Muglia noted that R2 is being built on the same code base as Windows Server 2003 SP1, which will be important to users who want to deploy R2 "without fear" of breaking applications.

Unlike service packs that are freely available to customers, R2 is considered a new release. Companies that bought individual licenses for earlier Windows Server products will therefore have to buy a new license for R2, Muglia confirmed. But customers who purchased Microsoft's Software Assurance maintenance and upgrade program or hold an Enterprise Agreement will be able to get R2 free of charge, he said.

Muglia acknowledged that one reason Microsoft is putting out the R2 update is to accommodate its Software Assurance customers, many of whom signed three-year contracts and may have expected an upgrade during that time frame. "If you decide your major releases are four years apart on average, and your Software Assurance customers are on three-year cycles, it's probably a good idea to have something to deliver value in between," he said.

But it remains unclear whether the R2 update will be sufficient to drive renewals or produce new sales of Software Assurance to Windows Server customers, or if it will appease users who expected a major release during their contract terms.

Michael Nuteson, a Chicago-based vice president and director of vendor management at Publicis Group SA, said upgrades are the prime benefit of Software Assurance, even though Microsoft last year enhanced the program by adding support and training options. He said that if there's no major release within the three-year time span of Software Assurance, it may not be worth it for some companies.

Yet Publicis plans to place its Windows servers under an Enterprise Agreement, which includes upgrade protection, because it will help to make the budgeting process more predictable, Nuteson said.

Measurable Value

Roger Gareipy, chief technologist and architect at Air Products and Chemicals Inc. in Allentown, Pa., said an interim server release that's easy to implement sounds interesting, as long as his company could choose which feature packs it wants to use. He noted that Air Products uses SharePoint Services and plans to look at digital rights management services.

Air Products has Software Assurance on its servers. But Gareipy said his company will upgrade to R2 only if it delivers measurable business value.

According to Tom Bittman, an analyst at Gartner Inc., "The reality is, a lot of people bought into Software Assurance thinking they were getting Longhorn. That's how they made their decision. [R2] isn't Longhorn." Gartner is predicting that the Longhorn server will emerge in 2008 — not 2007, as Microsoft claims.

Discussion has swirled about the potential for features to be cut from Longhorn in order for Microsoft to get the product out the door on schedule. Muglia said Microsoft won't be "taking massive pieces of functionality out of the system," but rather will cut back some features that people might have been expecting.

He noted that the new WinFS storage subsystem may not be at the stage where it can be used for collaboration by hundreds of users by the time Longhorn ships. "There may be some cases where, thinking about the scale aspects of a server and the scale aspects of a file system, some of those things might need to wait until post-Longhorn for it to happen," Muglia said.

The setting of the Longhorn server target date helped to shed some light on Microsoft's client plans. Windows Server will typically ship six to 12 months after the client operating system, Muglia said. With the Longhorn server pegged for 2007, the Longhorn client could emerge any time from the beginning of 2006 to the first half of 2007.

"You could potentially squeak it into 2005, but I think it's a tight squeeze to get in that time frame," Muglia said, adding that he doesn't drive the client schedule. "The expectation is that it would not be later than 2006." **46877**

Muglia Discusses Competitive Threat From Linux

Bob Muglia, senior vice president of Microsoft's Windows Server division, last week spoke with *Computerworld* about a range of issues, including the competitive threat posed by Linux. Excerpts follow:

How is Microsoft differentiating itself from the Linux competition? I don't really think that Linux itself is our competitor. I think Linux is a set of technologies, and open-source technologies in general are a set of technologies that competitors like Red Hat or Novell and IBM pull together to provide alternative competitive solutions for customers. Linux has evolved to be a commercial product. All the customers I sell to buy Linux-based products from companies like Red Hat or Novell. They put them together, stacks with other software, typically commercial software, like WebSphere. And if you look at a solution that exists in that space – say, an IBM solution – it's certainly not free. The cost of acquiring that is actually quite comparable to the cost of acquiring a Microsoft solution.

How can users get an edge by running non-Microsoft applications on Windows instead of Linux? Because we're a software company, our objective straightforwardly is to use software to reduce the cost and increase the innovation for an IT organization. I think our objectives are very much in alignment with those of most IT shops inside major companies. And there's a huge distinction of that versus an environment where complexity is what is encouraged and services must be added on top of that. I think if you look at Linux and Linux stacks and the companies that are promoting those, they have a vested interest in selling consulting services. We don't. It's that simple.

For which server workloads are you seeing the most competition from Linux? Application migration off of Unix is one where certainly Linux has some traction. Typically, there are custom-built business applications that people have on proprietary Unix that they want to move to x86 hardware. . . . Another category is networking environments, where their needs tend to be fairly simplistic.

– Carol Sliwa

MORE ONLINE

To read more of our interview with Muglia, visit our Web site:

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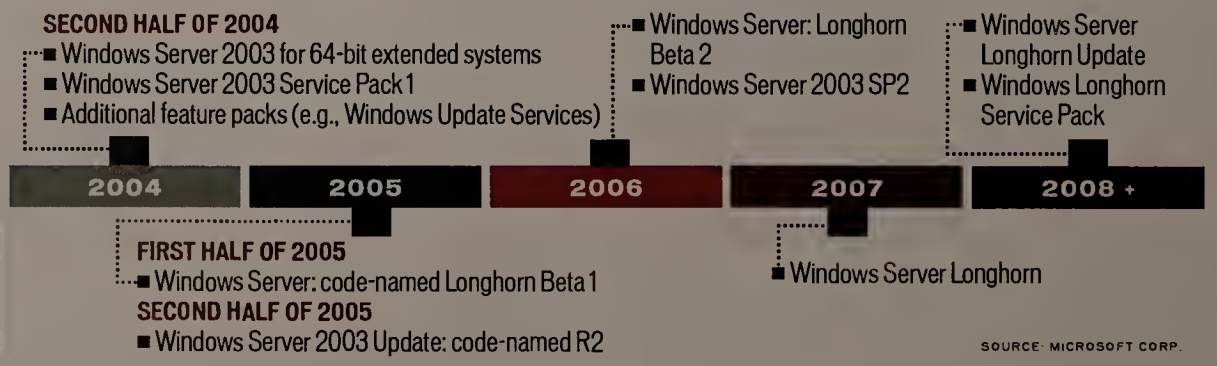
Microsoft Windows Server Timeline



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FRANK HAYES ■ FRANKLY SPEAKING

App Toasters

I'VE BEEN LOOKING at appliances in Las Vegas. No, I haven't picked the wrong town to shop for microwave ovens and washing machines. These appliances are at the NetWorld+ Interop trade show. Security appliances. Bandwidth appliances. Antispam appliances. Network identity appliances. The days are gone when "network appliance" just meant storage. These days, appliances are popping up all over the network.

No surprise there — the networking guys figured out the advantages of appliances long ago. They weren't waylaid by the idea that an appliance had to be the IT equivalent of a toaster or a washing machine. In the networking game, any function that can be isolated in a single box is a candidate for appliancehood.

But they aren't just for networks anymore.

Oh, there's always still a network angle. The network is how an appliance gets connected to users. But from switches and routers, the appliance idea has been climbing up the network stack. These days, you can buy load-balancing appliances, VPN appliances, XML appliances — functions that always used to be software.

Sure, there's software inside an appliance. But with an appliance, you don't get software to install and patch and upgrade and manage. In an appliance, you get a box. You plug it in. It works. It's designed to be treated like hardware.

Now appliances are knocking on application software's door. One company at N+I is rolling out an appliance with CRM software for small businesses. Another wants to help midsize software vendors put all kinds of applications on appliances. Instead of a disk, vendors would ship a box — with a hardened, preconfigured, plug-in-and-go application that's ready to use.

Will that idea work? That will depend on software vendors and early adopters. But what if it does take off, even just for certain kinds of apps?

Capacity management becomes a very different problem. Instead of trying to juggle application-server CPU usage, IT shops will be worrying about whether they've bought the right number of boxes.

Per-user licensing? Per-seat? Per-server? It all comes down to per-appliance licensing.

The operating system running the application becomes invisible on an appliance — the app is served across the network. And because each appliance runs as its own little island on the network, applications that crash or misbehave have a much harder time corrupting or slowing down other applications. One app with a bug or security hole can't shut everything down.

Apps can be tuned and hardened by vendors, because the apps will run on known, tested hardware. And upgrading an application could be as simple as pulling the old appliance and plugging in a new one.

Drawbacks? There are plenty, especially for big data centers. You think handling power and cooling requirements is a challenge now? Just wait until every application draws its own current — literally. Apps that need to interact with other apps will chew up network bandwidth, and those interactions will take longer because they're running across the network, not just across a server's data bus.

But what's likely to create the biggest roadblocks for application appliances isn't any technical difficulty. It's us.

Face it, this is alien stuff. Decades of experience tell us that applications are supposed to live together on servers. It's our job to do the tuning and keep them from interfering with one another. We're the ones who put in the patches and manage the conflicts and guesstimate the server capacity required.

Application appliances take almost all of those issues away. That work is just no longer needed.

But think about this: If you lost your ability to tune and tweak and troubleshoot server applications — if you lost your *need* to do that — what would you do with all that freed-up time and effort?

Maybe you should be looking at appliances, too. **46865**

FRANK HAYES, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

How to Save Users Time

Hospital installs a spam filter to save users time, but it doesn't work well. "False positives are the great majority of messages quarantined," groans a pilot fish. He can live with sorting through all those quarantined messages, but when the filter delays some of his messages for weeks, fish calls the help desk. "You're the only one having trouble," staffer tells him. "Everybody else just deletes messages from the spam filter." Grumbles fish, "I guess they're right – not getting my e-mail *would* sure save me time."

SHARK TANK

Right Now!

Panicked user grabs mainframe pilot fish late on a Friday afternoon and says the monthly report he just received is identical to last month's. User says the data snafu *must* be fixed at once or he can't do his job. "After investigating, I found a system change had indeed stopped updating the file that created his report – 10 months before," says fish. "He had been getting the exact same report for 10 months. He got a strange look on his face when I told him this – in front of my manager, of course. And then I walked out the door to enjoy my weekend."

Problem Solved

Elementary school's PCs are infected with adware and spyware, so IT pilot fish installs a firewall and uses it to block access to the adware sites and trains the local tech in how to block and unblock. In two weeks, the blocked-site logs are clear. Nice job! fish tells local tech. But he spoke too soon. "All that spyware was causing too many 'blocked site' e-mails," tech tells fish. "So I allowed access to each of those sites. Now I'm not getting all of those e-mails!"

Some Users Get It . . .

User complains to help desk pilot fish that someone is "remote controlling" her PC. "She even removed the network cable, and somehow they were still controlling her machine," says fish. But before fish has a chance to set up a site visit, she figures it out for herself. "Her co-worker had the same wireless mouse, and when she used her machine, it was remote controlling the other user's PC," fish says. "They fixed it by moving a little farther apart."

. . . And Some Don't

The keys on this user's keyboard keep sticking, she says. But as support pilot fish is swapping in a new keyboard, he tips the old one on its side – and out pours about half a cup of soda. I think I know what caused your keys to stick, fish says. Her reply: "It couldn't be the soda that caused it, because it was a *diet* soda that spilled."

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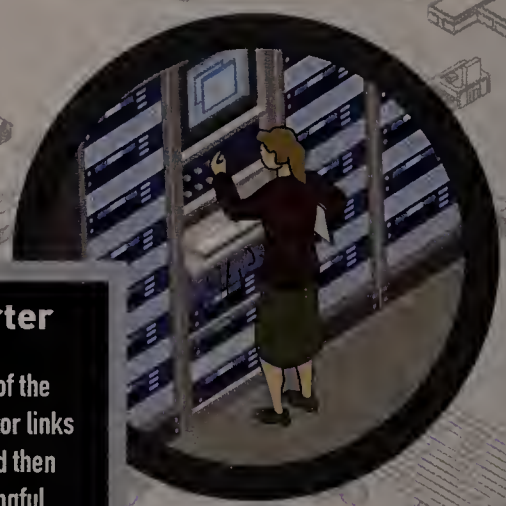

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